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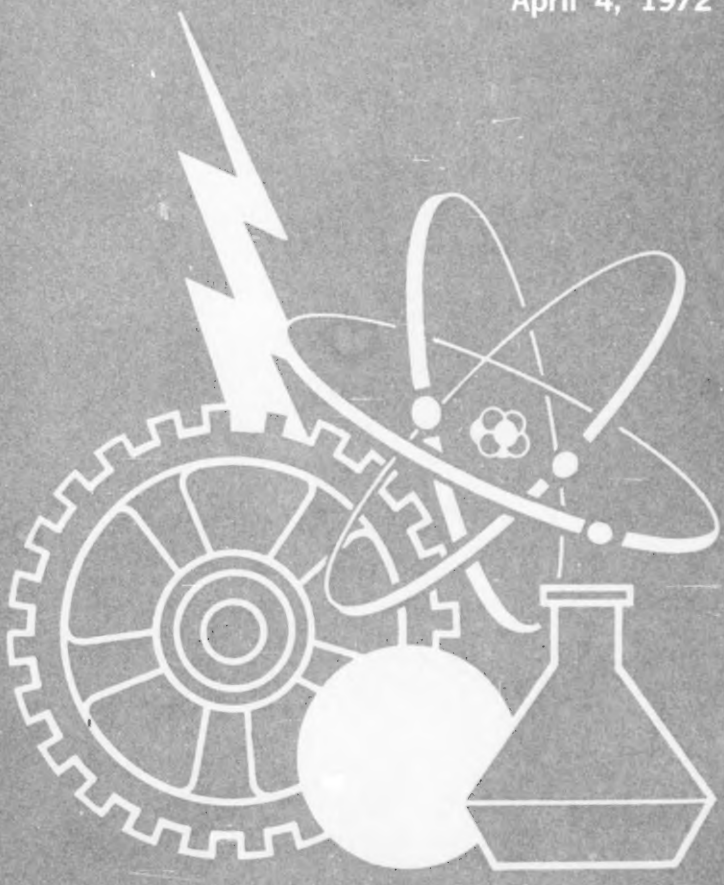
PATENTS

April 4, 1972



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OF COMMERCE

Patent
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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

April 4, 1972 Volume 897 Number 1

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PATENT OFFICE NOTICES

Trademark Manual of Examining Procedure

Work is in progress on a Manual of Trademark Examining Procedure which is being designated in brief as "TMEP." The preliminary material for the Manual consists of directives which are being prepared and issued at intervals. Each directive is devoted to a particular procedure in the trademark examining process, and the directives constitute official guidelines for the examination of trademark applications.

Ten directives have been issued to date.

Trademark Examining Directives can be ordered from the Superintendent of Documents, United States Government Printing Office, Washington, D.C., 20402, at an annual subscription of $1.50, plus 50¢ for foreign mailing.

(See original announcement dated July 27, 1971 in the OFFICIAL GAZETTE of August 31, 1971, vol. 889, No. 5.)

ROBERT GOTTSCHALK,
Commissioner of Patents.

Feb. 29, 1972.

PETITION TO MAKE TRADEMARK APPLICATIONS SPECIAL

The practice of expediting the prosecution of new trademark applications on request of the applicant (accelerated prosecution) was rescinded, effective Aug. 1, 1971 (36 F.R. 13231, July 16, 1971; 825 O.G. 2). This action was taken after a careful study of the practice, including a recommendation of the Public Advisory Committee for Trademark Affairs that the Patent Office terminate accelerated prosecution of trademark applications. The study considered both the effect of the procedure on the workload of the Trademark Operations and the broader interest of examining trademark applications in an order which is equitable to all applicants.

Since the termination of this practice, the Office has experienced some increase in the number of petitions requesting the Commissioner to invoke his supervisory authority pursuant to Rule 2.146 in order to advance the examination of applications out of their regular order. This was to be expected since applicants who might have been able to show special circumstances entitling them to advanced examination could previously achieve this special treatment without resorting to a petition. However, some of the petitions now being received are not considered sufficient to justify the extraordinary relief of invoking the supervisory authority of the Commissioner for the purpose of advancing the applications out of their regular order.

In particular, a number of such petitions have been based on the ground that the applicant is about to embark on an advertising campaign or to commit advertising or promotional expenditures in which the mark applied for is material. Such a ground is not considered to constitute appropriate circumstances justifying the advancement of the application out of its regular turn and the petitions based on such ground have been and will continue to be denied. The principal reason for the denial is that these circumstances are applicable to a substantial portion of the trademark applications filed in the Patent Office. The supervisory authority of the Commissioner should be exercised only where an extraordinary reason for such action has been disclosed. See *Anderson & Dyer* v. *Lowry*, 89 O.G. 1861, 1899 C.D. 230, and *Wilputte* v. *Van Ackeren*, 103 USPQ 235. Thus, the extraordinary remedy of invoking the supervisory authority of the Commissioner is not considered appropriate under these circumstances.

In the interest of equitable treatment of all applicants, the policy of the Office in granting such petitions will be restricted to those cases in which particular and very special circumstances exist, such as a demonstrable possibility of loss of substantial rights, rather than circumstances which would be equally applicable to a large number of other applicants for trademark registration.

ROBERT GOTTSCHALK,
Commissioner of Patents.

Date: Mar. 13, 1972.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,723,785, E. M. Moore, MACHINE FOR TOPPING TROUSERS, **filed** Feb. 6, 1970, D.C., W.D. Okla. (Oklahoma City), Doc. 70–65–C, *Elton M. Moore* v. *Walt Shultz, doing business as Walt Shultz Equipment Company.* Court without venue, and case dismissed (Judge Luther Bohanon), Nov. 2, 1971.

2,757,610, Gegenheimer and Siebke, SHEET HANDLING MECHANISM AND METHOD FOR MULTI-COLOR PERFECTOR PRESS, **filed** Apr. 27, 1970, D.C., E.D.N.Y. (Brooklyn), Doc. 670C543, *Miller Printing Machinery Co.* v. *Royal Zenith Corp.* Order of discontinuance, Dec. 8, 1971.

2,919,061, B. D. Power, VAPOUR VACUUM PUMPS, **filed** Nov. 4, 1968, D.C., W.D.N.Y. (Buffalo), Doc. C–1968–361, *Norton Company and Edwards High Vacuum International Limited* v. *The Bendix Corporation.* Stipulation of Dismissal, Nov. 26, 1971.

2,923,144, T. R. Smith, FLUID CONTROL SYSTEM FOR WASHING MACHINE, **filed** Nov. 30, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c2990, *The Maytag Co.* v. *General Motors Corp.* On stipulation, ordered complaint be dismissed, Nov. 24, 1971.

2,995,271, Frater and Frater, STACKABLE AND NESTABLE CONTAINER, **filed** Mar. 3, 1969, D.C., N.D. Ohio (Cleveland), Doc. C69–158, *G. B. Lewis* v. *Molded Fiber Glass Companies, Inc.* Stipulation and order dismissing case with prejudice, Dec. 8, 1971.

3,056,224, Almy and Zentmyer, TESSELLATED SURFACE COVERING, **filed** Nov. 14, 1967, D.C.N.J. (Newark), Doc. 1168–67, *Armstrong Cork Company* v. *Kentile Floors, Inc.* Stipulation and order of dismissal, Dec. 13, 1971.

3,161,460, E. Huber, SPRAYING UNIT, **filed** Mar. 5, 1968, D.C. Del. (Wilmington), Doc. 3496, *Ernst Huber* v. *Block Drug Company, Inc., Park Pharmacy and Lawrence G. Abrahams.* Stipulation and order dismissed without prejudice; Park's counterclaim dismissed without prejudice; consent judgment, Dec. 6, 1971, patent owned by plaintiff valid, infringed by Block; Block's first and second counterclaims are dismissed with prejudice, Dec. 6, 1971.

3,179,026, A. F. Crone, SEALING ELEMENT FOR PAVEMENT GROOVES, **filed** Apr. 29, 1966, D.C., N.D. Ohio (Toledo), Doc. C66–89, *Acme Highway Products Corporation* v. *The D. S. Brown Co. and Delmont Brown.* Judgment entered July 3, 1969 is vacated, further defendants enjoined.

3,290,203, Antonson and Berger, TRANSPARENT AND REFLECTING ARTICLES, **filed** Aug. 25, 1970, D.C., S.D. Tex. (Houston), Doc. CA 70–H–914, *Minnesota Mining and Manufacturing Company* v. *Sun-X International, Inc., Monte E. Pendleton and Albert Clements.* Consent judgment, patent valid and infringed; injunction issued, Nov. 23, 1971.

3,316,294, Feighner and Kapur, DETERGENT ALKYLATE AND THE SULFONATE DERIVATIVE, **filed** Jan. 6, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c12, *Continental Oil Co.* v. *Witco Chemical Co., Inc.* Plaintiff is entitled to an injunction restraining further infringement by defendant, Nov. 16, 1971.

3,317,926, R. L. Hall, SWIMMING POOLS, **filed** July 21, 1967, D.C.N.J. (Newark), Doc. 663–67, *Raymond L. Hall and Quaker City Industries, Inc.* v. *U.S. Fiber and Plastics Corp.* Judgment, claims 11, 12 and 15 invalid and dismissing complaint, Nov. 17, 1971.

3,485,234, R. C. Stevens, TUBULAR PRODUCTS AND METHOD OF MAKING SAME, **filed** Dec. 9, 1971, D.C., S.D. Ind. (Indianapolis), Doc. IP71–C–692, *Cordis Corporation* v. *Cook Incorporated.* Defendant infringed, permanently enjoined, Dec. 9, 1971.

3,494,253, Hood and Truitt, METALLIC STRIP MILLING MACHINE, **filed** Dec. 15, 1970, D.C., E.D.N.Y. (Brooklyn), Doc. 70C1517, *Metals Engineering Co.* v. *North American Specialties Corp.* Order of dismissal with prejudice, Nov. 23, 1971.

3,518,099, E. Holbus, PROTECTIVE COATING FOR METAL SURFACES, **filed** Feb. 5, 1971, D.C., E.D. Wis. (Milwaukee), Doc. 71-C-54, *Edward Holbus* v. *Edick Industries, Inc. and R. J. Shelstad.* Consent judgment, Nov. 26, 1971.

3,526,326, J. A. Castaldi, STORAGE RETRIEVAL APPARATUS WITH POSITIONAL CONTROL MEANS, **filed** June 4, 1971, D.C., E.D.N.Y. (Brooklyn), Doc. 71C680, *Supreme Equipment & Systems Corp.* v. *Atomic Development Corp. and William Arent.* Consent judgment, Dec. 3, 1971.

3,540,612, W. T. Brady, BOTTLE CAP AND BOTTLE COMBINATION, **filed** May 18, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c1209, *Bio Dynamics, Inc.* v. *Serosonic Laboratories.* Final order and judgment, plaintiff owner of patent and said patent is valid; Serosonic Laboratories, Inc. have infringed and are enjoined, Nov. 19, 1971.

Certificates of Correction for the Week of Apr. 4, 1972

D. 221,553	3,588,852	3,603,244	3,609,862
2,935,129	3,588,936	3,603,267	3,609,932
3,373,286	3,589,139	3,603,808	3,609,985
3,412,137	3,590,287	3,603,844	3,610,493
3,459,763	3,590,932	3,603,924	3,610,817
3,483,187	3,591,003	3,604,063	3,610,827
3,493,676	3,591,076	3,604,366	3,610,871
3,505,837	3,591,436	3,604,435	3,611,011
3,507,966	3,591,790	3,604,456	3,611,084
3,508,127	3,592,028	3,604,459	3,611,307
3,509,258	3,592,045	3,604,499	3,611,529
3,510,825	3,593,073	3,604,546	3,611,824
3,531,830	3,593,098	3,604,623	3,611,856
3,534,105	3,594,440	3,604,988	3,612,410
3,536,719	3,594,783	3,605,033	3,612,423
3,537,253	3,594,897	3,605,224	3,612,446
3,549,965	3,594,977	3,606,492	3,612,495
3,551,340	3,594,995	3,606,615	3,612,540
3,563,032	3,595,061	3,606,869	3,612,727
3,563,893	3,595,312	3,606,902	3,613,161
3,566,472	3,595,341	3,606,921	3,613,333
3,567,045	3,595,669	3,607,047	3,613,557
3,567,774	3,595,957	3,607,120	3,613,640
3,568,764	3,595,998	3,607,206	3,613,642
3,569,771	3,596,618	3,607,243	3,613,786
3,573,488	3,596,679	3,607,305	3,613,787
3,574,253	3,597,029	3,607,622	3,613,789
3,574,724	3,597,351	3,607,623	3,613,886
3,575,659	3,597,539	3,607,816	3,614,074
3,576,528	3,597,865	3,607,829	3,614,233
3,577,166	3,598,323	3,607,891	3,614,292
3,577,250	3,598,377	3,607,984	3,615,399
3,577,423	3,598,842	3,608,050	3,615,583
3,577,476	3,599,085	3,608,061	3,615,697
3,577,665	3,599,111	3,608,066	3,615,710
3,580,188	3,599,523	3,608,469	3,615,739
3,580,753	3,599,800	3,608,535	3,615,790
3,581,094	3,599,807	3,608,572	3,617,142
3,582,461	3,600,097	3,608,607	3,617,249
3,583,246	3,600,398	3,608,701	3,617,430
3,584,974	3,600,567	3,608,766	3,617,623
3,585,033	3,600,747	3,608,830	3,617,736
3,585,184	3,601,002	3,608,869	3,617,846
3,585,243	3,601,319	3,609,036	3,618,712
3,585,331	3,601,347	3,609,082	3,619,157
3,586,243	3,601,767	3,609,151	3,619,445
3,586,450	3,601,838	3,609,166	
3,588,275	3,602,749	3,609,505	
3,588,835	3,602,824	3,609,759	

Disclaimers and Dedications

3,112,160.—*Robert L. Rush,* Wellington, Kans. METHOD FOR PRODUCING TEXTILE YARN FROM A MONOFILAMENT OF A BLEND OF OLEFIN POLYMERS. Patent dated Nov. 26, 1963. Disclaimer and dedication filed Dec. 28, 1971, by the assignee, *Phillips Petroleum Company.*

Hereby disclaims said patent and dedicates to the Public the remaining term of said patent.

3,283,788.—*Anthony Bottomley,* Maplewood, N.J., and *David C. Bottomley,* Bartlesville, Okla. PRODUCTION OF WOVEN THERMOPLASTIC FABRICS. Patent dated Nov. 8, 1966. Disclaimer and dedication filed Dec. 28, 1971, by the assignee, *Phillips Petroleum Company.*

Hereby disclaims said patent and dedicates to the Public the remaining term of said patent.

3,302,501.—*Max E. Greene,* Bartlesville, Okla. METHOD OF FIBRILLATING PLASTIC FILM BY PASSING THE FILM THROUGH ROTATING PIERCING MEANS. Patent dated Feb. 7, 1967. Disclaimer and dedication filed Dec. 28, 1971, by the assignee, *Phillips Petroleum Company.*

Hereby disclaims said patent and dedicates to the Public the remaining term of said patent.

3,369,435.—*Harold D. Boultinghouse,* Bartlesville, Okla. METHOD AND APPARATUS FOR FIBRILLATING. Patent dated Feb. 20, 1968. Disclaimer and dedication filed Dec. 28, 1971, by the assignee, *Phillips Petroleum Company.*

Hereby disclaims said patent and dedicates to the Public the remaining term of said patent.

3,395,525.—*William R. Eddy,* Kansas City, Kans. METHOD AND APPARATUS FOR FRICTIONALLY FIBRILLATING FILMS. Patent dated Aug. 6, 1968. Disclaimer and dedication filed Dec. 28, 1971, by the assignee, *Phillips Petroleum Company.*

Hereby disclaims said patent and dedicates to the Public the remaining term of said patent.

3,397,825.—*Paul E. Wilkins,* Bartlesville, Okla. METHOD OF FIBRILLATING ORIENTED FILM. Patent dated Aug. 20, 1968. Disclaimer and dedication filed Dec. 28, 1971, by the assignee, *Phillips Petroleum Company.*

Hereby disclaims said patent and dedicates to the Public the remaining term of said patent.

3,401,517.—*Paul L. Spivy,* Bartlesville, Okla. METHOD OF FIBRILLATION. Patent dated Sept. 17, 1968. Disclaimer and dedication filed Dec. 28, 1971, by the assignee, *Phillips Petroleum Company.*

Hereby disclaims said patent and dedicates to the Public the remaining term of said patent.

3,416,299.—*Anthony Bottomley,* Maplewood, N.J. PILE FABRICS FROM NONWOVEN FABRICS. Patent dated Dec. 17, 1968. Disclaimer and dedication filed Dec. 28, 1971, by the assignee, *Phillips Petroleum Company.*

Hereby disclaims said patent and dedicates to the Public the remaining term of said patent.

3,416,714.—*Bradley Skinner,* Bartlesville, Okla. METHOD OF FIBRILLATION. Patent dated Dec. 17, 1968. Disclaimer and dedication filed Dec. 28, 1971, by the assignee, *Phillips Petroleum Company.*

Hereby disclaims said patent and dedicates to the Public the remaining term of said patent.

Dedications

3,245,891.—*Simon P. Gary,* Villa Park, Ill. METHOD FOR ELECTROLYTICALLY SHAPING GROUP 5B METALS. Patent dated Apr. 12, 1966. Dedication filed Dec. 23, 1971, by the assignee, *Anocut Engineering Company.*

Hereby dedicates to the Public the portion of the term of the patent subsequent to Dec. 24, 1971.

3,287,246.—*Lynn A. Williams,* Winnetka, and *Leonard Malkowski,* La Grange, Ill. ELECTROLYTIC SHAPING AND CAVITY SINKING APPARATUS. Patent dated Nov. 22, 1966. Dedication filed Dec. 23, 1971, by the assignee, *Anocut Engineering Company.*

Hereby dedicates to the Public the portion of the term of the patent subsequent to Dec. 24, 1971.

3,288,698.—*Norbert A. Bruns,* Palatine, Ill. ELECTRODE FOR ELECTROLYTIC CAVITY SINKING. Patent dated Nov. 29, 1966. Dedication filed Dec. 23, 1971, by the assignee, *Anocut Engineering Company.*

Hereby dedicates to the Public the portion of the term of the patent subsequent to Dec. 24, 1971.

3,305,470.—*Lynn A. Williams*, Winnetka, and *Norbert A. Bruns*, Palatine, Ill. ELECTROLYTIC SHAPING APPARATUS FOR SEQUENTIALLY REDUCING THE THICKNESS OF AN ELONGATED WORKPIECE. Patent dated Feb. 21, 1967. Dedication filed Dec. 23, 1971, by the assignee, *Anocut Engineering Company*.

Hereby dedicates to the Public the portion of the term of the patent subsequent to Dec. 24, 1971.

3,309,303.—*Joseph L. Bender*, Wheeling, and *Lynn A. Williams*, Winnetka, Ill. ELECTROLYTIC CAVITY SINKING APPARATUS. Patent dated Mar. 14, 1967. Dedication filed Dec. 23, 1971, by the assignee, *Anocut Engineering Company*.

Hereby dedicates to the Public the portion of the term of the patent subsequent to Dec. 24, 1971.

3,311,549.—*Norbert A. Bruns*, Palatine, Ill. ELECTROLYTIC SHAPING APPARATUS. Patent dated Mar. 28, 1967. Dedication filed Dec. 23, 1971, by the assignee, *Anocut Engineering Company*.

Hereby dedicates to the Public the portion of the term of the patent subsequent to Dec. 24, 1971.

3,328,279.—*Lynn A. Williams*, Winnetka, and *James E. Davis*, Elmwood Park, Ill. CONTROL AND OPERATING SYSTEM FOR ELECTROLYTIC HOLE SINKING. Patent dated June 27, 1967. Dedication filed Dec. 23, 1971, by the assignee, *Anocut Engineering Company*.

Hereby dedicates to the Public the portion of the term of the patent subsequent to Dec. 24, 1971.

3,352,774.—*Lynn A. Williams*, Winnetka, Ill. APPARATUS FOR ELECTROLYTICALLY TAPERED OR CONTOURED CAVITIES. Patent dated Nov. 14, 1967. Dedication filed Dec. 23, 1971, by the assignee, *Anocut Engineering Company*.

Hereby dedicates to the Public the portion of the term of the patent subsequent to Dec. 24, 1971.

3,390,748.—*Charles E. Hein*, Newfield, N.Y., *and Michael A. Schober*, Rosemont, Ill. FLUID SHEAR COUPLING. Patent dated July 2, 1968. Dedication filed Jan. 21, 1972, by the assignee, *Borg-Warner Corporation*.

Hereby dedicates to the People of the United States the entire remaining term of said patent.

3,421,997.—*Lynn A. Williams*, Winnetka, Ill. ELECTRODE FOR ELECTROLYTIC SHAPING. Patent dated Jan. 14, 1969. Dedication filed Dec. 23, 1971, by the assignee, *Anocut Engineering Company*.

Hereby dedicates to the Public the portion of the term of the patent subsequent to Dec. 24, 1971.

3,433,728.—*Merlin O. Petroff*, Grayslake, Ill. CONTROL SYSTEM FOR ELECTROLYTIC MACHINING APPARATUS. Patent dated Mar. 18, 1969. Dedication filed Dec. 23, 1971, by the assignee, *Anocut Engineering Company*.

Hereby dedicates to the Public the portion of the term of the patent subsequent to Dec. 24, 1971.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MARCH 7, 1972

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-08-71
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-04-70
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	1-14-71
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	2-01-71
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods: Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	10-01-70
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	7-07-71
SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	10-08-70
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	2-24-71
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	4-01-71
PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	1-05-71
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	1-06-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	2-03-71
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	1-04-71
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	12-16-70
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	3-08-71
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	2-01-71

Expiration of patents: The patents within the range of numbers indicated below expire during April 1972, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,705,322 to 2,707,276, inclusive
Plant Patents..... Numbers 1,374 to 1,388, inclusive

PLANT PATENTS

GRANTED APRIL 4, 1972

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,092
SHADBLOW TREE
William Flemer III, Princeton, N.J., assignor to Treesearch, Kingston, N.J.
Filed Jan. 14, 1970, Ser. No. 2,979
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—51 **1 Claim**

1. A new and distinct variety of shadblow tree, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a vigorous, more rapid and upright habit of growth, unusually hard and thick trunk and branches which are stronger and stiffer than those of other varieties of shadblow trees, with consequent greater resistance to extreme bending and damage by wind, snow and ice storms, freedom from the production of base "suckers," larger and broader flowers than those of either parent variety, and a distinctive and exceptionally attractive Fall foliage color varying from dark Red to strong Red and Dark Reddish Orange.

3,093
WHITE AZALEA PLANT
Alfred N. Roberts, Corvallis, Oreg., assignor to Geo. J. Ball, Inc., West Chicago, Ill.
Filed Feb. 9, 1970, Ser. No. 10,058
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—55 **1 Claim**

A new variety of hybrid azalea plant characterized by its profuse production of white blossoms of medium size, which have excellent keeping quality, and by its vigorous, well branched growth and strength under pot forcing in greenhouse culture.

3,094
ROSE PLANT
Jack S. Sweet, St. Petersburg, Fla., assignor to Geo. J. Ball, Inc., West Chicago, Ill.
Filed Feb. 9, 1970, Ser. No. 10,059
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—26 **1 Claim**

A new variety of rose plant originating as a sport of Mother's Day (unpatented) and characterized by its very delicate French Rose coloration and its adaptability to greenhouse pot-forcing culture.

3,095
ROSE PLANT
Marie-Louise Meilland, Cap d'Antibes, France, assignor to The Conard-Pyle Company, West Grove, Pa.
Filed Feb. 25, 1970, Ser. No. 14,249
Claims priority, application France, Dec. 3, 1969, 6906632
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—18 **1 Claim**

A rose plant of the grandiflora class obtained from crossing Zambra (Plant Pat. No. 2140) with a seedling of Baccara (Plant Pat. No. 1367) crossed with Message (known in the United States as White Knight) (Plant Pat. No. 1359).

3,096
HONEY-LOCUST TREE
Chester J. Halka, Englishtown, N.J., assignor to Frank J. Schmidt & Son Co., Troutdale, Oreg.
Filed Mar. 3, 1970, Ser. No. 16,272
Int. Cl. A01h *5/12*
U.S. Cl. Plt.—52 **1 Claim**

1. A new and distinct variety of honey-locust tree of the species botanically known as *Gleditsia triacanthos inermis*, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of an unusually rapid rate of growth substantially double that in trunk caliper size in comparison with the normal rate for the species *Gleditsia triacanthos inermis*, particularly during its early years, a dense branching habit, with the lateral branches extending inwardly of the tree to give it a greater fullness and less pendulous form than is usually typical of the species, a round-headed tree form, and attractive green foliage which becomes yellow in the fall season.

3,097
ROSE PLANT
Carl Meyer, Cleves, Ohio, assignor to The Conrad-Pyle Company, West Grove, Pa.
Filed Mar. 30, 1970, Ser. No. 24,041
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—11 **1 Claim**

A rose plant of the hybrid tea class obtained by crossing a variety known as Pink Parfait (Plant Patent No. 1,904) with a variety known as Pink Peace (Plant Patent No. 1,759).

3,098
ROSE PLANT
Herbert C. Swim and O. L. Weeks, Ontario, Calif., assignors to O. L. Weeks, doing business as Weeks Wholesale Rose Grower, Ontario, Calif.
Filed Apr. 6, 1970, Ser. No. 26,176
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—20 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of an unusually tall and vigorous plant habit, but with a fullness which adds to the overall effect of being complete with ample foliage of good quality, a habit of producing flowers in a true hybrid tea manner and borne almost without exception on long, single stems which are of heavy caliper and strong, consistently large flowers having above average petal substance which permits each flower to retain a classic high-centered fullness both on the plant and as cut flowers for long periods of time, a distinctive and attractive deep reddish purple overall flower color, but having a more vivid, velvety red shading on the inside of the petals, and a complete absence of thorns on all new growth, with a consequent easier handling ability as cut flowers.

3,099
POINSETTIA PLANT
Thormod Hegg, Lierbyen, Norway, assignor to Paul Ecke, Inc., Encinitas, Calif.
Filed Apr. 9, 1970, Ser. No. 27,192
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—86 **1 Claim**

1. A new and distinct variety of poinsettia plant, substantially as herein shown and described, characterized

particularly as to novelty by the unique combination of a general similarity in most respects to the variety "Annette Hegg," including a short growing and compact plant habit, a uniform and fast rooting habit, a self-branching habit which produces multiple blooms without pinching off the terminal buds, attractive green foliage, distinctive, attractive and stable pink bracts instead of red bracts like "Annette Hegg," and long-lasting plant qualities.

3,100
PLUM TREE
Willilam T. Pipkin, 3193 W. Caruthers Ave., Caruthers, Calif. 93609
Filed Nov. 21, 1968, Ser. No. 777,925
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—38 **1 Claim**

The present invention relates to a new and distinct variety of plum tree broadly characterized by fruit having a distinctively striped skin and by blossoms significantly larger than the blossom of the unpatented Santa Rosa variety of plum which variety the instant variety most nearly resembles.

3,101
NECTARINE TREE
Chris Floyd Zaiger, 537 Rosemore Ave., Modesto, Calif. 95351
Filed July 24, 1969, Ser. No. 844,673
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of nectarine tree, as illustrated and described, which bears large to medium clingstone fruit having yellow flesh approximately five days earlier than Grand River (Plant Patent #1248), but being an improvement by bearing larger, firmer fruits than other nectarines at this maturity period and further characterized by having a very high degree of red color over nearly the entire exterior area of the fruit.

PATENTS

APRIL 4, 1972

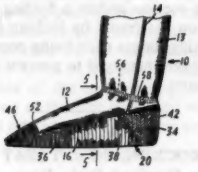
GENERAL AND MECHANICAL

3,653,074

FOOT FOR CHILD'S SLEEPING GARMENT

Charles B. Noble, and Maurice A. Jacobs, both of Flushing, N.Y., assignors to J. C. Penney Company, Inc., New York, N.Y.

Filed Jan. 19, 1968, Ser. No. 699,222
Int. Cl. A41d *11/00*
U.S. Cl. 2—80 **4 Claims**



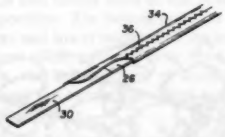
The foot part of a child's sleeping garment is rendered more comfortable and less subject to wearing out by virtue of a construction embodying an upper foot element joined to, and preferably a part of, the garment leg and encompassing the top portion of the foot, a sole element joined to the lower margin of the upper element and including marginal portions along the sides and around the heel that extend somewhat above the floor when in place on the wearer, and a toe element overlying the toes of the wearer. The sole is formed from a blank or pattern in which square cut-outs are made at each corner of the heel end, and the two edges of each cut-out are then joined together thereby to form a shaped heel. The pattern of the sole piece is further characterized by substantially straight, longitudinally extending edges that taper toward each other moving from the heel toward the toe. Consequently, the height of the side parts of the sole piece that extend up from the floor gradually diminishes moving in the direction of the toe. The toe and sole pieces are formed of durable materials having external surfaces adapted to resist wear and to provide non-slip characteristics.

3,653,075

STRETCHABLE STRAP OR THE LIKE

Gerald W. Gluckin, 180 Madison Avenue, New York, N.Y., and Ronald J. Bower, 21 Bolan Drive, Huntington Station, N.Y.

Filed Sept. 24, 1970, Ser. No. 74,954
Int. Cl. A41f *15/00*, *3/02*, *1/00*
U.S. Cl. 2—338 **2 Claims**



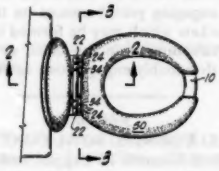
An elongated composite construction serving as a strap or belt having an inner core consisting of an interconnected long strip of flannel or other non-stretchable material and a short elastic strip such that the construction has stretch confined to the elastic. Completing the construction is a tubular cover for the core which, although of moderate stretchability, nevertheless provides stretch which is compatible with that of the elastic strip because of its considerably greater length.

3,653,076

WATER CLOSET CONSTRUCTION

Archie E. Warnberg, 3600 N.W. 43rd Street, Oklahoma City, Okla.

Filed June 24, 1970, Ser. No. 49,435
Int. Cl. A47k *13/12*
U.S. Cl. 4—236 **9 Claims**



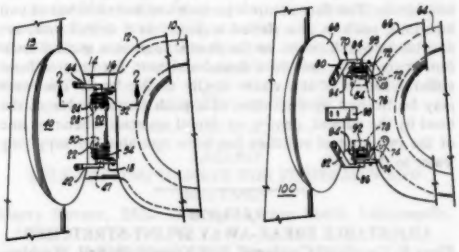
A toilet or water closet construction which includes a bowl, a seat, a seat lid and a hinge structure which pivotally connects the seat or seat lid or both to the bowl. The hinge structure includes a portion secured to the bowl and at least one leg which is pivotally connected to the portion secured to the bowl, and which is also connected to the seat and lid. The seat is exposed along its rear edge portion to receive without interference by the hinge structure, the rear of a flexible cover which covers at least the upper surface of the seat. In like manner, the lid may be exposed along its rear edge portion to receive without interference from the hinge structure, the rear edge portion of a flexible cover which covers the upper surface of the seat lid.

3,653,077

QUICK DETACHABLE TOILET SEAT HINGE STRUCTURE

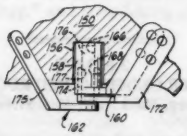
Archie E. Warnberg, 3600 N.W. 43rd Street, Oklahoma City, Okla.

Filed July 16, 1970, Ser. No. 55,415
Int. Cl. A47k *13/12*
U.S. Cl. 4—236 **24 Claims**



A water closet construction including a bowl having a seat pivotally mounted thereon by means of a hinge structure which includes one or more socket engaging protuberances, or post receiving apertures or openings. The socket engaging protuberances are adapted to be projected into sockets formed either in a cylindrical sleeve forming another portion

of the hinge structure, or one or more sockets formed in the rear portion of the bowl. The water closet structure further includes a tank which is mounted on the rear side of the bowl, and supported on the bowl by a spacing device which spaces the tank upwardly from the horizontal upper surface



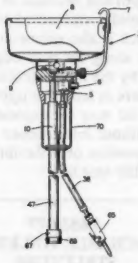
of the bowl. The water closet structure may further include a lid having at least two arms connected thereto and having either socket engaging protuberances on the arms which fit into hollow sockets which may be formed in another portion of the hinge structure or in the bowl, or having apertures therein which detachably engage posts carried on the bowl.

3,653,078

PORTABLE DENTAL BOWL CONSTRUCTION

Dean H. Buchtel; Kenneth R. Lappin, and John A. Maurer, all of Canton, Ohio, assignors to The Weber Dental Manufacturing Company, Canton, Ohio

Filed Oct. 28, 1970, Ser. No. 84,785
Int. Cl. A61c *17/04*
U.S. Cl. 4—263 **6 Claims**



A portable bowl construction which may be mounted removably on a dental chair, or a dental tray, or which the patient may hold. The portable bowl has flush water and drain connections. There are dual controls for a solenoid valve that controls the supply of water not only to flush the bowl but also to a venturi vacuum pump connected to the bowl drain. The dual controls include control switches at two locations, such as at a dental tray and at a dental unit, accessible at one location to the dentist, and at a second location at the same time to a dental assistant, for control from either location of the water supply to the bowl. The bowl may be flushed by operation of a push button valve at the bowl by the patient, dentist, or dental assistant whenever one of the two control switches has been operated for supplying water to the bowl.

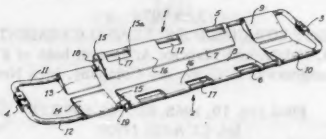
3,653,079

ADJUSTABLE BREAK-AWAY SPLINT-STRETCHER

Elroy E. Bourgraf, Cincinnati, and Kenneth R. Self, Washington C. H., both of Ohio, assignors to Ferno-Washington Inc., Greenfield, Ohio

Filed July 6, 1970, Ser. No. 52,535
Int. Cl. A61g *1/00, 1/04*
U.S. Cl. 5—82 **13 Claims**

An adjustable break-away splint-stretcher having a tubular frame mounting body supporting panels, the stretcher frame being provided at its opposite ends with pivot locks which are selectively disengageable to permit the opposite halves of the stretcher frame to be pivoted outwardly about the other pivot lock, the stretcher frame also being provided with an extensi-



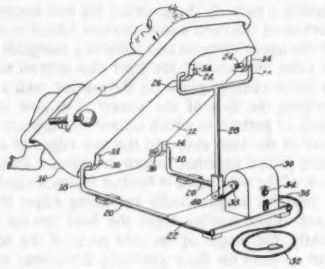
ble leg supporting section and/or a folding head supporting section mounted on the frame by locking hinges, the pivot locks and the locking hinges each being provided with finger actuated release means arranged to prevent accidental disengagement of the parts.

3,653,080

ROCKING INFANT SEAT

Robert X. Hafele, Overland Park, Kans., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Nov. 23, 1970, Ser. No. 92,090
Int. Cl. A47d *9/02, 13/10;* A63g *9/16*
U.S. Cl. 5—108 **3 Claims**



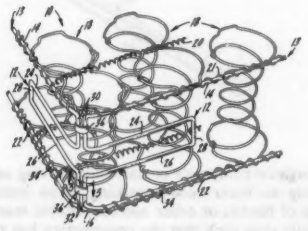
A seat adapted for use by an infant is automatically rocked back and forth by a suitable linkage mechanism connected by a reducing gear means to a motor.

3,653,081

MATTRESS CORNER CONSTRUCTION

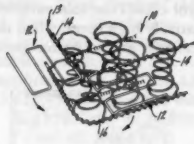
Wilton J. Davis, Rensselaer, Ind., assignor to Sealy, Inc., Chicago, Ill.

Filed May 28, 1970, Ser. No. 41,208
Int. Cl. A47c *23/04, 25/00*
U.S. Cl. 5—262 **18 Claims**



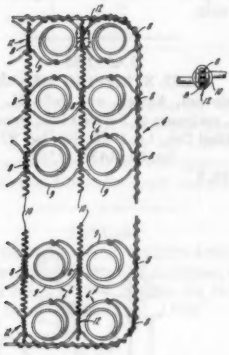
An improved corner construction for a mattress inner spring unit wherein the corner construction comprises a pair

of adjacent spring corner supporting wires that initially lie on the top face of the inner spring unit in a non-supporting posi-



tion to permit the inner spring unit to be compressed to facilitate shipment. The corner support wires can be rotated to a vertical supporting position at each corner of the inner spring unit so that the corners of the inner spring unit are reinforced and stiffened. In the supporting position one of the corner support wires of the pair is aligned substantially parallel to one side of the inner spring unit and the other corner support wire of the pair is aligned substantially parallel to the adjacent side of the inner spring unit.

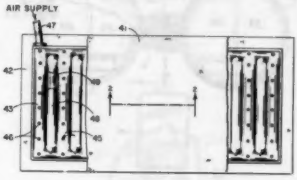
3,653,082
MATTRESS SPRING UNIT CONSTRUCTION
Wilton J. Davis, Rensselaer, Ind., assignor to Sealy, Inc., Chicago, Ill.
Filed Aug. 13, 1970, Ser. No. 63,588
Int. Cl. A47c *23/04, 25/00*
U.S. Cl. 5—269 **3 Claims**



An improved mattress inner spring unit having a plurality of coil springs arranged in rows with each coil spring being comprised of a series of convolutions. Each coil spring terminates in end convolutions which have offset portions formed thereon. The coil springs are arranged in the inner spring unit so that the offset portions extend into overlapping relation with adjacent offset portions. Such an arrangement allows the coil springs to be secured together by spirally rotating a helical coil across each of the rows so as to interlace the offset portions. The helical coils are thus positioned in both the upper and lower surfaces of the inner spring unit. When all adjacent offset portions have been interlaced with the helical coils, the end portions of each helical coil are compressed around the overlapped offset portions of the outermost row of coil springs.

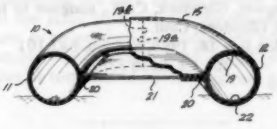
3,653,083
BED PAD
Roy Lapidus, 18 Donn Road, Newton, Mass.
Continuation-in-part of application Ser. No. 687,055, Nov. 30, 1967, now abandoned. This application May 11, 1970, Ser. No. 36,200
Int. Cl. A47c *27/08*
U.S. Cl. 5—348 **5 Claims**

An aerated bed pad is described which permits varied positions of comfort for the user. The bed pad comprises a sheet of open foam supported by a perforated, branched plastic tube having a single open end into which a current of air is passed. The air passes out through the perforations then through the foam sheet to the body of the user. The air supply is variable and the tube inflatable and deflatable. In one model there are two interlaced, alternating tubes. In



another model one tube is interlaced with spaced, nonporous resilient strips.

3,653,084
INFLATABLE STRUCTURE
Michael G. Hartman, 11 1/2 Mile Steese Highway, Fairbanks, Ala.
Filed Apr. 2, 1970, Ser. No. 25,181
Int. Cl. B63b *7/08*
U.S. Cl. 9—2 A **4 Claims**

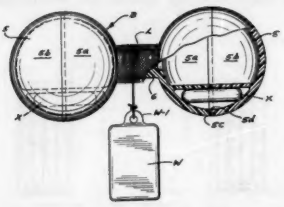


An inflatable structure and method of making it. The structure comprises a knitted fabric body shell, which has been impregnated with a curable elastomeric material, which material forms an outer surface coating in the structure. The fabric body shell is made up of a knitted fabric, and before impregnation is manufactured to have a shape, were the shell in an inflated condition, roughly corresponding to the shape of the finished article or structure. An inflatable, flexible-walled bladder, having substantially the same shape when inflated, is provided within the body shell to enable shaping of the body shell through inflation of the bladder. With the body shell shaped by inflation of this bladder, the elastomeric material is applied, as by spraying or brushing, to impregnate the body shell and to form a protective covering about the outside of the body shell covering any seams, etc. The bladder may remain in the structure on its completion, and for this purpose may have an elastomeric coating applied about its outer surface which cures to form a rubber-like coating on the inside of the fabric body shell.

3,653,085
SELF-SETTING MARKER FOR FISHERMEN AND BOATMEN
Harry Rovner, 2832 Xenwood Avenue South, Minneapolis, Minn.
Filed May 7, 1970, Ser. No. 35,453
Int. Cl. B63b *21/52*
U.S. Cl. 9—8 **1 Claim**

A self-setting marker device for fishermen and boatmen has a buoyant somewhat elongate, symmetrical body provided with an axial substantially reduced medial portion constituting with adjacent larger portions a spool element upon which an anchoring line is attached and may be helically wound. A small heavy anchoring weight is attached to the

outer end of the line and serves to by gravity pay out the line (with revolution of the body) when the device with wound line is cast upon the water. Closely cooperating with said components is a bias-weight medium secured to said body in



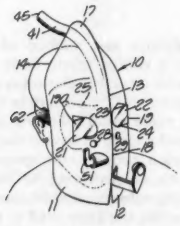
a position of balance relative to the body length, but disposed widely eccentric of the axis of said body to restrain revolution of said body during the torque effect of said line and anchor weight; and effective to positively stop further pay off of line when the anchor weight rests upon the bottom of a water way. Then the requisite length of anchor line is measured and set for various depths each time the wound device is cast, and further pay off of line and driftage of the body is prevented in spite of usual winds and water currents.

3,653,086

STREAMLINE SWIM MASK

Calvin A. Gongwer, Glendora, Calif., assignor to Innerspace Corporation, Glendora, Calif.

Filed July 18, 1969, Ser. No. 843,101
Int. Cl. A63b *33/00*
U.S. Cl. 9—329 **15 Claims**



A streamline face mask for swimmers which can be used with either a snorkel or underwater air equipment is secured to the head of the swimmer to provide a smooth surface over the face and across the head of the swimmer and thereby reduce drag. The shape of the mask is determined by a pair of connected side members which cooperate to form a forwardly projecting prow portion and a centrally positioned relatively sharp edge which extends longitudinally from the prow.

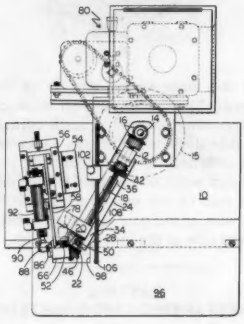
3,653,087

MACHINE FOR FEEDING THE CURVED PERIPHERY OF A WORKPIECE PAST A WORK STATION

Wladyslaw Typrowicz, Belmont, Mass., assignor to Jacob S. Kamborian, West Newton, Mass.

Filed Nov. 16, 1970, Ser. No. 89,789
Int. Cl. A43d *43/06*
U.S. Cl. 12—20 **2 Claims**

A machine for feeding the curved periphery of a sole past a cement applying station. A sensing device is so located that it is intersected by the sole when the side portions of the sole periphery are fed past the station and is not intersected by the sole when the toe portion of the sole periphery is fed past the station. A control causes the sole periphery to be fed past the station at a relatively high speed when the sensing device is intersected by the sole and to be fed past the station at a



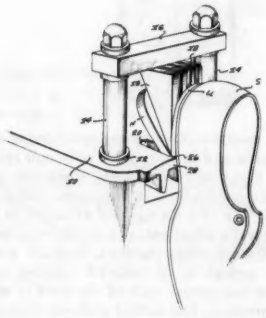
relatively low speed when the sensing device is not intersected by the sole.

3,653,088

HEEL STRIPPING MEANS

Henry R. Padovani, Austell, and John G. Wright, Atlanta, both of Ga., assignors to Textron Inc., Providence, R.I.

Filed Dec. 11, 1970, Ser. No. 97,143
Int. Cl. A43d *115/00*
U.S. Cl. 12—50.5 **3 Claims**



An improved anvil for use in a device used to strip or remove heels from shoes in preparation for placing a new heel thereon, the anvil having slots which receive reciprocating stripping blades and having one end of such slots closed by portions of a relatively narrow web forming a continuous surface for supporting the breast of a heel being stripped, such web having a thickness which corresponds to the minimum heel base thickness that is to be left unstripped. Preferably, the side face of this web is concavely formed to correspond generally with the configuration of a sole shank, and the top face of the web is formed convexly to correspond generally with the configuration at the breast of the heel being stripped.

3,653,089

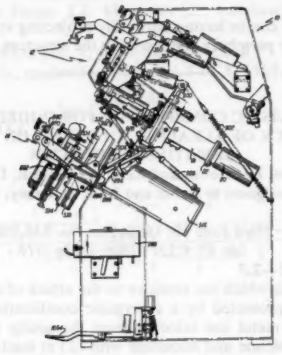
METHOD FOR APPLYING CEMENT BETWEEN A SHOE UPPER AND A SHOE INSOLE

Jacob S. Kamborian, West Newton; Allen C. Harriman, Brockton, and Karl F. Vornberger, Tewksbury, all of Mass., assignors to Jacob S. Kamborian, Boston, Mass.

Original application Aug. 30, 1967, Ser. No. 664,475, which is a division of application Ser. No. 528,430, Feb. 18, 1966, now Patent No. 3,422,474. Divided and this application Mar. 6, 1970, Ser. No. 24,950

Int. Cl. A43d 9/00

U.S. Cl. 12—142 R 6 Claims



There is disclosed herein a cement lasting machine having mechanism for applying cement to the periphery of an insole that is mounted to the bottom of a last and for wiping the margin of an upper located on the last against the insole to thereby cementatiously attach the upper margin to the insole.

3,653,090

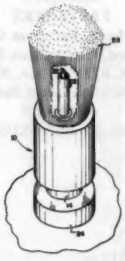
COMBINATION SHAVING BRUSH AND STAND

Ronald L. Weaver, Route 2, Box 529, Lebanon, Oreg.

Filed July 27, 1970, Ser. No. 58,561

Int. Cl. A46b 11/02, 17/06

U.S. Cl. 15—105 1 Claim



A shaving brush and stand with the brush having a central shaving cream passageway occupied by a stem portion of the stand when the brush is stored in place thereon. Removal of the brush from the stand leaves the passageway open for the subsequent flow of aerated shaving cream. The lower end of the shaving brush is shaped for momentary sliding connection with a standard pressurized aerosol shave cream container to impart a charge of shaving cream to the brush bristles.

3,653,091

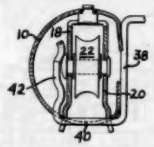
CURTAIN ROD, PULLEY CASE, AND SUPPORT COMBINATION

Robert P. McKenna, 111 Liverpool Street, Warwick, R.I., and John E. Williamson, 22 Third Street, W. Barrington, R.I.

Filed May 25, 1970, Ser. No. 40,215

Int. Cl. A47h 1/10

U.S. Cl. 16—94 10 Claims



A hollow, tubular, curtain rod of the draw curtain type is provided with an internally mounted pulley case and a support bracket arrangement whereby the pulley case rests on the bracket and the rod rests on the pulley case. This provides for direct application of stress on the draw cords to the bracket rather than to the rod. In addition means are provided for securing the case against motion relative to the bracket at the same time without introducing an unsightly bracket arm in an exposed position at the front of the rod. Other features include adaptability of the pulley case for fitting either of two sizes of telescoping rods without modification.

3,653,092

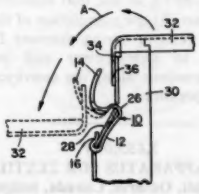
HINGE CLIP ASSEMBLY

Donald R. Shriner, Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed July 27, 1970, Ser. No. 58,265

Int. Cl. E05d 9/00

U.S. Cl. 16—128 3 Claims



A hinge clip assembly having an attachment body portion and a retaining finger portion is frictionally mounted on a rear support bracket of a major domestic appliance, with the retaining finger portion extending in a curvilinear upward position to operatively project within an opening in a rear flange on a cover member for such appliance, when such cover member is pivoted to an open position, and to retain such cover member in such open position to facilitate the servicing of such appliance.

3,653,093

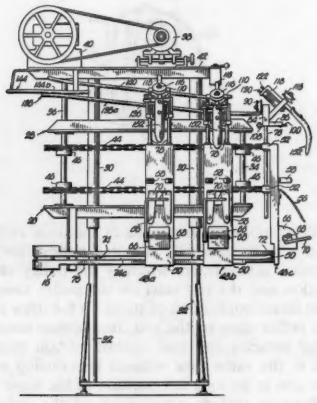
POULTRY EVISCERATING MACHINE

Donald J. Scheier, Kansas, Mo., assignor to Gordon Johnson Company, Kansas City, Mo.

Original application Jan. 26, 1968, Ser. No. 700,907, now Patent No. 3,555,593, dated Jan. 19, 1971, and a continuation-in-part of 700,907, Jan. 26, 1968, now Patent No. 3,555,593, dated Jan. 19, 1971. Divided and this application Nov. 12, 1970, Ser. No. 88,948

Int. Cl. A22c *21/06*

U.S. Cl. 17—11 **15 Claims**



In the automatic evisceration of poultry the viscera is displaced from the body cavity of the bird through an access opening cut at the vent. In one form of the invention, a spoon-like removal tool applies pressure on the viscera away from the breast and drags the viscera along the backbone. In a second form, a removal tool in the nature of a loop captures the viscera and pulls it from the cavity. The entire operation takes place while the birds are advanced continuously by an overhead conveyor from which they are suspended by their legs. A series of bird-receiving carriages travel around a loop in timed relation to the conveyor, and each carriage is provided with an individual removal tool which enters the cavity on an arc that conforms to the configuration of the breast. At the completion of the operation, a latch is released to remove spring pressure from the tool, causing the latter to swing clear and permitting the eviscerated bird to continue along the conveyor line for successive processing operations.

3,653,094

CONVERSION APPARATUS FOR TEXTILE FIBERS

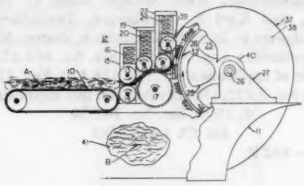
Hugh J. Fairfield, Galt, Ontario, Canada, assignor to Du Pont of Canada Limited, Montreal, Quebec, Canada

Continuation-in-part of application Ser. No. 751,272, Aug. 8, 1968, now abandoned , which is a continuation-in-part of application Ser. No. 597,263, Nov. 28, 1966, now abandoned. This application Nov. 21, 1969, Ser. No. 878,826

Int. Cl. D01b *9/00*

U.S. Cl. 19—83 **6 Claims**

An apparatus for converting a mass of textile filaments in the form of textile material waste, tangled thread waste or cold-drawable continuous filaments of a synthetic polymer to a useful product comprising a forwarding means for slow feeding the filaments under a restrained condition to a rotatable substantially cylindrical open structure having a multiplicity of outwardly projecting filament-engaging needles mounted around the periphery of the structure and a



number of combs having outwardly projecting teeth mounted around the periphery and spanning the structure.

3,653,095

SYNERGISTIC COMBINATION FOR INHIBITING THE ATTACK OF ALKALINE SOLUTIONS ON ALKALI SENSITIVE SUBSTRATES

Jean Dupre, Levittown, and Keith A. Booman, Dresher, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed June 18, 1969, Ser. No. 835,906

Int. Cl. C23f *11/06;* **C23g** *1/18*

U.S. Cl. 21—2.7 **14 Claims**

Materials which are sensitive to the attack of alkaline solutions are protected by a synergistic combination of: (1) at least one metal ion selected from the group consisting of barium, calcium and strontium with (2) at least one surface-active agent selected from the group consisting of (A) alkyl glycosides having a formula corresponding to ROG_mH, wherein G is a glycosyl radical, R is an alkyl radical of six to 16 carbons connected to the number 1 carbon atom of glycosyl radical through the oxygen and *m* is an integer in the range of 1 to about 4, (B) ethylene oxide adducts of said alkyl glycosides containing up to two ethylene oxide units per glycosyl radical and (C) amino carboxylic acids having an alkyl radical of at least 10 carbons and metal salts of amino carboxylic acids in alkaline solutions used for cleaning. Optionally in certain applications, and essentially in other applications, a third element may be made a part of the synergistic combination, namely (3) a water soluble naphthalene derivative.

3,653,096

FASTENERS

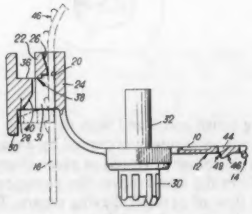
Paul Carl Roger Fernberg, Farnham Common, England, assignor to ITW Limited, Cippenham, Slough, England

Filed Sept. 8, 1970, Ser. No. 70,275

Claims priority, application Great Britain, Sept. 16, 1969, 45,666/69

Int. Cl. B65d *63/00*

U.S. Cl. 24—16 PB **12 Claims**



An improvement to the fastener of the type which has a strip with flexible ratchet teeth projecting from its face over a

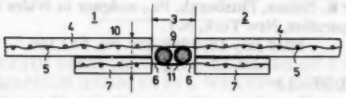
portion of the length of the strip, the strip being passable through a slot from which the teeth then prevent withdrawal, the improvement being in the provision of a release member adjacent to the slot, which member can be manually resiliently depressed so that as the strip is pulled back, a cam face on the member successively depresses the teeth and permits them to pass back into the slot. The entire fastener can be integrally molded in plastics material.

3,653,097

MEANS FOR CONNECTING TOGETHER THE ENDS OF BANDS OF FABRIC

Heinz Kerber, Weidenthal, Upper Platinate, Germany, assignor to Firma J.J. Marz GmbH, Lambrecht, Pfalz, Germany

Filed Feb. 4, 1970, Ser. No. 8,665
Claims priority, application Germany, Feb. 5, 1969, P 19 05 544.8
Int. Cl. F16g *3/02*
U.S. Cl. 24—33 C **6 Claims**



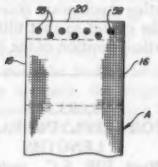
Means for connecting together the ends of fabric bands, which comprise connecting members. Each of the connecting mem bers has a thickness smaller than that of the fabric end of each fabric band to be connected together.

3,653,098

CONNECTOR FOR FLAT WOVEN TAPE

Roe H. Lagarde, Oxford, and Clarke Murphy, Jr., Baltimore, both of Md., assignors to E. W. Bliss Company, Canton, Ohio

Filed Aug. 19, 1969, Ser. No. 851,412
Int. Cl. F16g *11/00*
U.S. Cl. 24—114.5 **4 Claims**



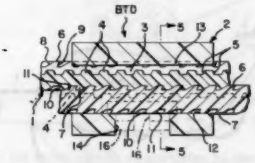
A flat woven tape has an end portion including opposite flat faces, opposite side edges and a terminal end. An enlarged lug of substantially rigid material is molded onto the end portion of the tape. The lug has first and second portions disposed on the opposite flat faces of the end portion of the tape. The lug includes a plurality of spaced-apart spanner elements extending through the end portion of the tape from one flat face to the other and interconnecting the first and second lug portions. The spanner elements provide an initial grip of the lug on the tape until the first and second portions of the lug wedge together and mechanically grip the end portion of the tape.

3,653,099

BUNDLE TIE DEVICE

Norman Edwin Hoffman, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 3, 1970, Ser. No. 60,677
Int. Cl. B65d *63/00*
U.S. Cl. 24—16 PB **3 Claims**



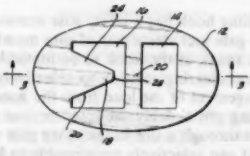
A bundle tie device comprises a loop through which a strip is fed and is guided therethrough by guide means provided by the loop and the strip. The strip has teeth on the top and bottom surfaces, each of the teeth has leading surfaces with a less acute angle than trailing surfaces. The strip is fed through the loop and guided around a bundle of wires or members to be bundles via a guide means of an applicator tool and the leading end of the strip is fed back through the loop whereupon the leading end of the strip is secured to the loop, then the strip is pulled with the teeth ratcheting along each other until the strip is tight around the bundle whereupon the teeth are in a meshed condition within the loop and a distance to either side, and the stored pressure in the bundle, by virtue of its configuration, aids in maintaining the teeth in this meshed and thereby locked condition although such pressure is not necessary. Other teeth are provided in a channel of the strip which are engaged by a feed means on the applicator to feed the strip through the loop and tighten the strip around the bundle. In a hand tie version the loop is prebonded to one end of the strip.

3,653,100

BELT

Charles E. Dolan, 13234 Chase Street, Panorama City, Calif.

Filed July 23, 1970, Ser. No. 57,542
Int. Cl. A44b *11/00*
U.S. Cl. 24—198 **3 Claims**



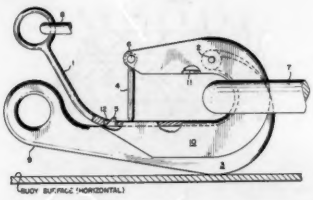
Herein described is a belt including a unitary buckle which is used to connect the ends of the belt together around the user's waist. The buckle inciudes a relatively flat member having a pair of openings therein which forms a center cross member between the openings. One end of the belt is coupled to the cross member. An inwardly extending tab protrudes from one side of the flat member towards the cross member. The other end of the belt has a plurality of locking apertures which are formed to match the shape of the tab. The belt is encircled around the wearer's waist and is inserted into the opening in the buckle having the locking tab. The tab is then inserted into a suitable opening in the belt and the remainder thereof is inserted through the opening.

3,653,101

QUICK-RELEASE, SELF-LOCKING HOOK

Henry C. Mayo, Fairfax County, Va., assignor to The United STates of America as represented by the Secretary of the Army

Filed [illegible], 1970, Ser. No. 4,659
Int. Cl. A44b *13/00*
U.S. Cl. 24—241 **1 Claim**



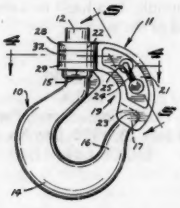
This quick-rele[illegible]self-locking type hook is attached to a buoy which is co[illegible] to an embedded anchor by a heavy chain or wire rope. This invention is directed to a self-locking capability to elimi[illegible] the necessity of human intervention in the locking process. This is accomplished by providing a locking keeper being pivotable for full 360°.

3,653,102

HOOK WITH GATE

Edward J. Crook, Jr., Fort Wayne, Ind., assignor to American Hoist & Derrick Company, St. Paul, Minn.

Filed July 21, 1970, Ser. No. 56,764
Int. Cl. A44b *13/00*
U.S. Cl. 24—241 SL **5 Claims**



A load handling hook has a safety gate across the throat of the hook. The gate includes a pair of gate members rotatably secured to the shank of the hook to be movable from throat closing to throat clearing relation to selectively prevent and permit disengagement of the load from the hook. A latch includes a locking pin [illegible] mounted in one gate member and extendible through a slot in the other gate member. This pin has an end cap selectively positionable to be engageable with or in clearing relation to the other gate member to selectively prevent and permit opening of the gate.

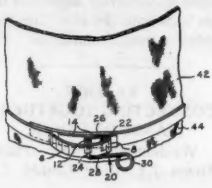
3,653,103

FILTER BAG CLAMP

Elmer Crosby Bush, Corry, Pa., assignor to Associated Spring Corporation, Bristol, Conn.

Filed June 1, 1970, Ser. No. 42,275
Int. Cl. B65d *63/00*
U.S. Cl. 24—270 **1 Claim**

The clamp holds the intake passage of a dust bag to the outer periphery of the exhaust passage of an air filter or the like, and consists of an elongated strip of spring metal having a central part which surrounds the aperture of the dust bag and intake, an integrally formed arcuate piece at one end of the strip which terminates in an open loop, and an eye adjacent the other end of the strip in which one arm of a wire lock form is pivotally mounted. When the strip is brought



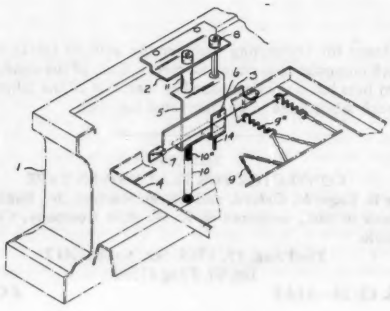
about the filter bag and intake the second arm of the wire lock form is put into the open loop and the wire form is moved to over center position to lock the strip in place.

3,653,104

ADJUSTABLE BEDS FOR BURIAL CASKETS

Walter K. Nelson, Pittsburgh, Pa., assignor to Walco National Corporation, New York, N.Y.

Filed July 18, 1969, Ser. No. 843,166
Int. Cl. A61g *17/00, 7/00*
U.S. Cl. 27—12 **3 Claims**



This disclosure shows a bed mounted in a casket that is adjustable and also tiltable from end to end and from side to side with the adjusting mechanism accessible from the top, at the end walls of the casket so that tilting adjustment can be effected at any vertical position of the bed.

3,653,105

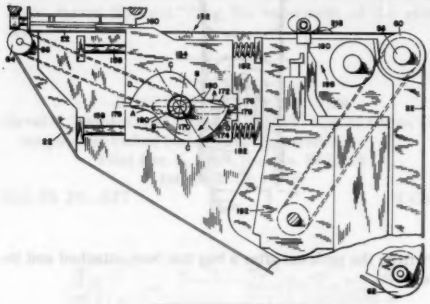
APPARATUS FOR SUPPLYING PARALLEL STRAND LENGTHS

Hans J. Klaeui, Rock Hill, S.C., assignor to Crompton & Knowles Corporation, Worcester, Mass.

Original application Mar. 13, 1969, Ser. No. 806,948, now Patent No. 3,564,872. Divided and this application Dec. 10, 1970, Ser. No. 96,800
Int. Cl. D02g *3/00*
U.S. Cl. 28—1 **6 Claims**

A machine for supplying parallel lengths of fibrous strands for incorporation in a non-woven fabric. A guide carriage reciprocates between a pair of continuously moving conveyors having strand engaging hooks. The carriage lays a band of strands, first around a set of hooks of one conveyor and then a set of hooks on the other conveyor. Before each crossing of the carriage, a rake adjacent each conveyor extends each strand, relative to the conveyor, a distance of one band width from a first holding element to a second holding

element upstream of the same conveyor. The carriage, rake, and conveyors are operated in timed relation so that the



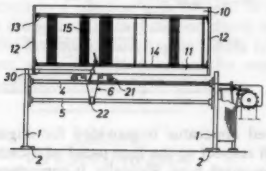
lengths of strands extending between conveyors will all be parallel for presentation to fabric forming means.

3,653,106

APPARATUS FOR DRAWING-IN THREADS OF A WARP THROUGH HEDDLES IN A WEAVING DEVICE

Svend Sigurd Christie Fleischer, Klampenborg, Denmark, assignor to Titan Textile Machines A/S, Soborg, Denmark

Filed Jan. 28, 1970, Ser. No. 6,390
Claims priority, application Denmark, Feb. 6, 1969, 644/69
Int. Cl. D03j *1/14*
U.S. Cl. 28—46 **10 Claims**



An apparatus for drawing-in warp threads through heddles arranged in several rows behind one another. In accordance with a program containing information about the drawing-in sequence, a selected magnet from a plurality of magnets each associated with one row of heddles is caused to grip and move a heddle from the associated row forward to the working field in which an operator may draw a thread through the heddle eye and then push the heddle aside. In response to a pulse initiated by the operator, the magnet is returned and the next heddle is moved to the working field by a different or the same magnet, as the case may be, in accordance with the program.

ERRATUM

For Class 29—110 see:
Patent No. 3,653,338

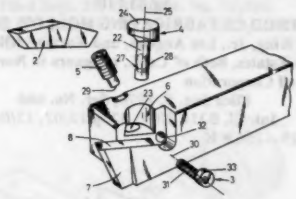
3,653,107

LATHE TOOL

Karl Hertel, Obedenberger Str. 29, 86 Nuernberg, Germany

Filed Jan. 13, 1970, Ser. No. 2,478
Claims priority, application Switzerland, Jan. 13, 1969, 386/69; July 2, 1969, 10179/69; July 16, 1969, 10860/69
Int. Cl. B26d *1/00*
U.S. Cl. 29—96 **19 Claims**

A lathe tool in which the bit is of a shape providing easy manufacture and regrinding, and a long life. The outline of the lateral faces of the bit is an elongate isosceles trapezium and an elongate isosceles triangle having as its base the longer of the two parallel sides of the trapezium, the end



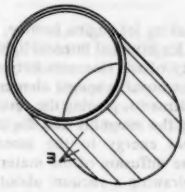
faces of the bit forming the equal sides of the trapezium, two inclined upper faces of the bit forming the two equal sides of the triangle and a cutting edge being formed at the junction of each upper face and the adjacent end face.

3,653,108

ROLLER ASSEMBLY

Paul Donald Maca, Western Springs, and Warren C. Schumacher, Clarendon Hills, both of Ill., assignors to Sommer & Maca Glass Machinery Company, Chicago, Ill.

Filed June 12, 1970, Ser. No. 45,860
Int. Cl. B21b *27/00*
U.S. Cl. 29—110 **1 Claim**



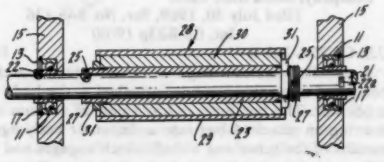
A roller assembly that can easily be installed between and removed from fixed bearings including a shaft which is supported in the bearings and may be removed through the bearings. A sleeve is removably attached to the shaft and a roller is mounted on the sleeve by removable locking means which in this embodiment are nuts which fit on externally threaded portions of the sleeve. Set screws are used to fasten the sleeve to the shaft and the shaft to the bearings.

3,653,109

METHOD OF PRODUCING COMPOSITE BUSHINGS

Frans Donatus Timmermans, 23 Kiel Brunswiker Str. 11a, Kiel, Germany

Filed Oct. 11, 1968, Ser. No. 767,589
Int. Cl. B21d *53/00*; B23p *11/00*
U.S. Cl. 29—149.5 **9 Claims**



In a process of making bearings of lead bronze a large steel cylinder is lined on the inside thereof with a layer of lead bronze, said layer being produced by centrifugal casting. The

steel cylinder and its lining layer are then cut to separate pieces along generatrices of the former and of the latter, and composite bearings are formed of these separate pieces.

3,653,110

METHOD OF FABRICATING HOLLOW BLADES

Julian P. King, Jr., Los Angeles, and Norman Klimmek, Palos Verdes Estates, both of Calif., assignors to North American Rockwell Corporation

Filed Jan. 5, 1970, Ser. No. 666
Int. Cl. B21k *3/04;* **B23p** *15/02, 15/04*
U.S. Cl. 29—156.8 H **7 Claims**

A method of making jet engine turbine, fan or compressor blades containing longitudinal internal lightening openings by locating a plurality of rib elements between exterior cover plates, locating a removable spacer element between each of the adjacent rib elements, placing the resulting assembly in a die cavity, placing the assembly and die in a thin-walled retort, applying heat energy to the assembly sufficient to promote solid state diffusion of the material of construction of the assembly, drawing a vacuum about the assembly, applying sufficient compressive pressure to the assembly by a press operatively engaging the die to cause the material to flow plastically in combination with the applied heat energy, maintaining the application of heat energy and pressure sufficient to effect homogenization of the interfacial joints of the assembly, removing the bonded assembly from the die and leaching the spacer elements from the assembly.

ERRATUM

For Class 29—200 see:
Patent No. 3,653,800

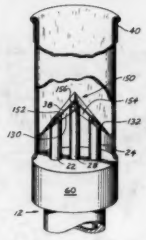
3,653,111

APPARATUS AND METHOD FOR OBTAINING A PREDETERMINED AND REPEATABLE FILL MEASURE IN A BAG-IN-CAN DISPENSER

Roger K. Bruce, Costa Mesa, Calif., assignor to Sterigard Company, Santa Ana, Calif.

Filed July 30, 1969, Ser. No. 846,136
Int. Cl. B23p *19/00*
U.S. Cl. 29—200 R **15 Claims**

A pedestal carries a bag indexer to index an arch-shaped bottom of a bag that has been attached to the body by a bag applicator. The bag indexer has a pair of vacuum tubes for drawing an attached bag into a dispenser body against the mouths of the tubes and a shaft which engages and supports the apex of the bag's arch during indexing. The position of the bag indexer is adjustable to adjust the bag's fill measure. The bag indexer is extended from a retracted position after a dispenser body is received on the pedestal for transport to the bag applicator to facilitate dispenser body removal and placement on the pedestal from an input conveyor. The bag indexer is also retracted to facilitate removal of a dispenser



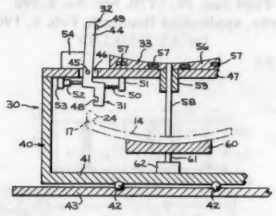
body from the pedestal after a bag has been attached and indexed.

3,653,112

APPARATUS FOR ALIGNING THE SHADOW MASK WITH RESPECT TO THE FACE PANEL OF A CATHODE RAY TUBE

Carl L. Smith, Auburn, and William H. Nicklas, N. Syracuse, both of N.Y., assignors to General Electric Company

Filed Mar. 19, 1970, Ser. No. 20,898
Int. Cl. B23p *19/00;* **H05k** *13/00;* **B23g** *3/00*
U.S. Cl. 29—203 J **7 Claims**



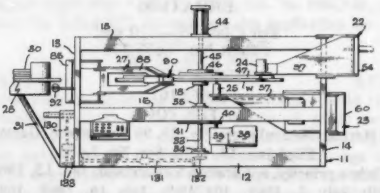
Improved apparatus is provided for aligning the shadow mask with respect to the face panel of a cathode ray tube of the shadow mask type. Basically, it comprises first means for supporting the face panel in a first position, second means for supporting frame means for the shadow mask in a second position spaced apart from the face panel, and third means for supporting the shadow mask for movement relative to the frame means and the face panel.

3,653,113

MACHINE FOR MAKING TABLETOPS

Daniel Marvosh, 3085 East Clarmeya Lane, Pasadena, Calif.

Filed Jan. 26, 1970, Ser. No. 5,672
Int. Cl. B23p *19/04;* **B27c** *5/00*
U.S. Cl. 29—208 D **3 Claims**



The application discloses a machine with a motor-driven rotatable work support, separate shaping, grooving and band-

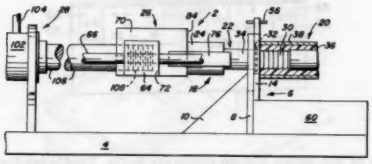
ing tools mounted on doubly pivoted arms for performing operations on a workpiece mounted on the support, and automatic means for controlling the speed of rotation of the work support in accordance with a predetermined pattern coordinated with the shape of work to be formed, and automatic means for controlling the movement of the pivoted arms.

3,653,114

HOSE COUPLING REMOVER

Orval C. Bawden, and Frank A. Dimick, both of Orem, Utah, assignors to United States Steel Corporation

Filed Dec. 4, 1969, Ser. No. 882,250
Int. Cl. B73p *19/00*
U.S. Cl. 29—237 **4 Claims**



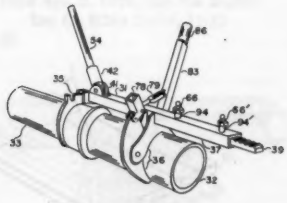
Apparatus for extracting a hose coupling from a hose, said coupling having a shank inserted in said hose and a coupling member extending axially outwardly from the end of said hose, said apparatus comprising a frame, means mounted on said frame for gripping said coupling member, a stationary support in said frame having an opening therein in which said coupling is inserted to a position with the end of said hose abutting against the surface of said support about said opening and means for actuating said gripping means to pull said coupling member away from said support to remove said shank from said hose.

3,653,115

PIPE JOINING JACK

Ralph Perkins, 727 West Pyron Street, San Antonio, Tex.

Filed Aug. 6, 1970, Ser. No. 61,555
Int. Cl. B23p *19/02*
U.S. Cl. 29—237 **1 Claim**



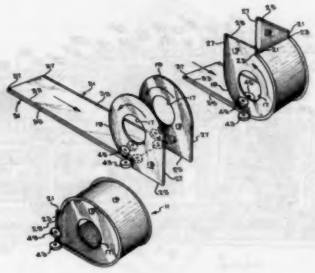
A compound joint jack for use in joining sewer pipes and other large underground pipes and adapted to operate in close quarters, having adjustable fittings and gripping jaws capable of gripping the smooth surface of various sizes of pipe without the use of chains or straps; such instrument enabling a single man to exert several hundred pounds of compression pressure with the use of a single lever and compound ratchet assembly in order to lock or unlock sections of pipes fitted with neoprene washers.

3,653,116

METHOD AND APPARATUS FOR FORMING CENTRIFUGAL FAN HOUSINGS

William L. Lov, McHenry, and Ned Blood, Hoffman Estates, both of Ill., assignors to ILG Industries Inc., Chicago, Ill.

Filed Sept. 25, 1970, Ser. No. 75,494
Int. Cl. B21k *21/00*; B21d *51/16*; B23p *19/04*
U.S. Cl. 29—243.52 **8 Claims**



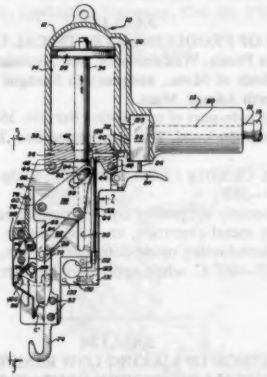
An apparatus is provided for fabricating centrifugal fan housings. The apparatus described includes novel means for supporting pressure rolls engageable with opposite sides of a housing side plate, and novel means for supporting and guiding the components of the housing during its formation.

3,653,117

CLIP TOOL AND METHOD OF CLINCHING

Robert L. Wolfberg, Skokie, and Paul W. Bojan, Norridge, both of Ill., assignors to Signode Corporation

Filed Sept. 1, 1970, Ser. No. 68,725
Int. Cl. B23p *19/00*; B23q *7/10*; B23p *11/00*
U.S. Cl. 29—429 **13 Claims**



A magazine fed clip tool of the stationary anvil type, and which utilizes closely nested clips or seal blanks for clinching ligatures or wires in the anvil. A clip is automatically fed to the clip tool and the clip tool preforms the clip into a non-nestable condition, after which the preformed clip is driven into the anvil jaw to be clinched about ligatures or wires. The method provides for stripping a clip from a closely nested stack, preforming the clip to a non-nestable condition and then clinching it about at least a pair of wires to form a clinched assembly.

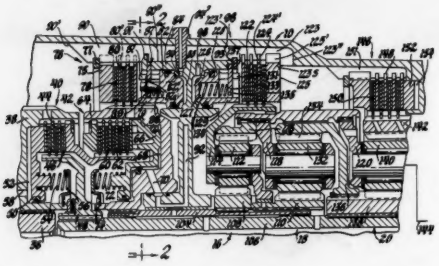
3,653,118
METHOD OF ASSEMBLING A TRANSMISSION

Erkki Koivunen, Livonia, Mich., assignor to General Motors Corporation, Detroit, Mich.

Original application June 11, 1969, Ser. No. 832,168, now Patent No. 3,596,537. Divided and this application Sept. 21, 1970, Ser. No. 74,023

Int. Cl. B23p *19/04;* **B23q** *3/18;* **B23g** *41/08*

U.S. Cl. 29—434 **5 Claims**



This transmission has multiratio drive planetary gearing and a plurality of fluid actuators for selectively engaging a plurality of friction devices to engage the ratio drives. A central web splined to the transmission housing has oppositely facing fluid actuators each having an annular piston in a cylinder. Each piston has an inner annular engagement seat and an outer interrupted annular engagement seat for engaging the brake plates with retraction springs and fastener posts located between the seats. A retainer plate has an annular portion between the seats engaging the springs and an aperture fitting on the retainer posts and has and has ear portions extending into engagement with the web. Snap rings hold the retainer plates and web against axial movement. A fastener on the fastener post holds the retainer plate and springs in assembled position for assembly into the transmission.

3,653,119
METHOD OF PRODUCING ELECTRICAL CAPACITORS

Elmo James Fresia, Williamstown, and Jeremiah E. Desmond, Boston, both of Mass., assignors to Sprague Electric Company, North Adams, Mass.

Continuation-in-part of application Ser. No. 358,099, Mar. 7, 1964, now abandoned. This application Dec. 28, 1967, Ser. No. 694,035

Int. Cl. H01g *13/00;* **C23b** *9/02;* **B23p** *17/04*

U.S. Cl. 29—585 **16 Claims**

Simultaneously subjecting an electrical capacitor comprising, a valve metal electrode, an anodic oxide layer thereon, and a semiconducting oxide counterelectrode, to a temperature of 250°–400° C. while applying a bias across the anodic oxide.

3,653,120
METHOD OF MAKING LOW RESISTANCE POLYCRYSTALLINE SILICON CONTACTS TO BURIED COLLECTOR REGIONS USING REFRACTORY METAL SILICIDES

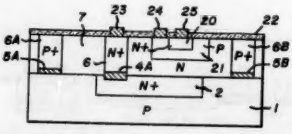
Richard C. Sirrine, Orange, Calif., and Leonard Stein, Dewitt, N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed July 27, 1970, Ser. No. 58,521

Int. Cl. B01j *17/00;* **H01l** *7/02*

U.S. Cl. 29—589 **4 Claims**

This disclosure relates to a method of forming a polycrystalline silicon contact to a buried collector region of a transistor or the like. This is accomplished by providing a monocrystalline silicon substrate body having a collector region exposed at its top surface. A layer of refractory metal is subsequently formed over the entire top surface of the body. Using conventional photomasking and etching techniques a refractory metal pad is formed over a portion of the exposed surface of the collector region, and an insulating layer is formed over the top surface of the body and pad. The insulated covered body is then heated to a temperature sufficient to completely convert the refractory metal to a refractory metal silicide while simultaneously causing the metal silicide to diffuse into the collector region. The insulating layer is next completely removed using a suitable etchant. A silicon layer is subsequently epitaxially deposited onto the top surface of the entire silicon substrate body. This layer forms as a column of polycrystalline silicon material above the refractory metal silicide region, and as an epitaxial layer of monocrystalline silicon material above the rest of the top surface of the substrate body. The column of polycrystalline silicon, is subsequently treated, so that, it has the same conductivity as the collector region and together with the refractory silicide region, constitutes a vertically extending low resistance conductive path from the top surface of the completed composite body down to the collector region buried beneath the epitaxial layer, and the epitaxial layer provides a site in which are formed other functional portions of the transistor or the like, such as base and emitter portions.



3,653,121
METHOD FOR MANUFACTURING A MEMORY PLANE

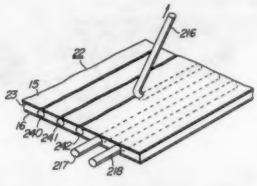
Hiromi Moriyama, Fujisawa-shi, and Susumu Hibi, Yokohama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 26, 1970, Ser. No. 5,856

Claims priority, application Japan, Jan. 27, 1969, 44/5260

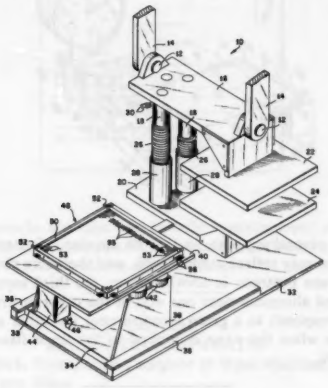
Int. Cl. H01f *7/06*

U.S. Cl. 29—604 **2 Claims**



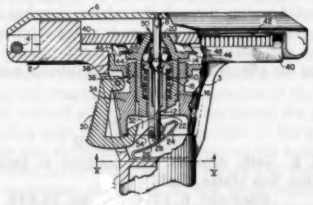
A method for manufacturing a memory plane including thin film magnetic wires, wherein moulding core wires embedded in an insulating sheet structure in a preceding stage are removed from the sheet structure in such a manner as to rip open the wall between one side of the structure and the moulding core wires such that said insulating sheet structure is formed with slots for accommodating the thin film magnetic wires therein.

3,653,122
ROD INSERTION METHOD
Floyd G. Powell, Jr., Torrance, Calif., assignor to The National Cash Register Company, Dayton, Ohio
Original application Mar. 16, 1969, Ser. No. 623,757, now Patent No. 3,508,314. Divided and this application Aug. 6, 1969, Ser. No. 848,005
Int. Cl. H01f 7/06
U.S. Cl. 29—604 7 Claims



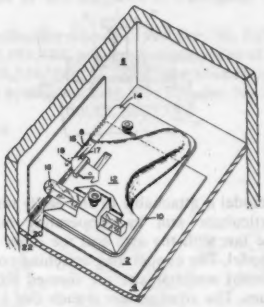
A process for inserting small magnetic rods in the open ends of a large number of solenoid coils positioned such that the open ends of the coils are located in a plane. An excessive number of the magnetic rods are placed onto the solenoid plane and the solenoid plane is positioned in a magnetic field with the coils substantially aligned with the magnetic lines of force. The magnetic field polarizes the rods to align them with the magnetic lines of force and accordingly, in parallel alignment with the coils. The rods are moved across the plane and are inserted into the solenoid coils as they become positioned over the open ends of the coils.

3,653,123
RAZOR HEAD
Phillip W. King, Cheshire; Kenneth A. Van Dyck, Weston, and James B. Wyatt, Stamford, all of Conn., assignors to The Gillette Company, Boston, Mass.
Filed Apr. 8, 1970, Ser. No. 26,589
Int. Cl. B26b 21/30, 21/32
U.S. Cl. 30—58 7 Claims



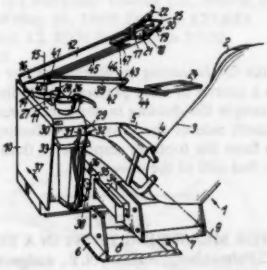
A razor head having a cap portion mounted thereon and adapted to pivot upon one end of the razor head, the cap being held and released by a ball chuck means disposed in the razor head. The ball chuck means includes means for adjusting the position of a razor blade retained by the razor head, relative to the razor head.

3,653,124
WALL EDGE TRIMMER FOR HARD SURFACE FLOORING
Richard J. Evans, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.
Filed Oct. 12, 1970, Ser. No. 79,725
Int. Cl. B26b 29/02
U.S. Cl. 30—293 1 Claim



The tool has two guiding edges and a cutter for trimming hard surface material to fit against a wall surface. The tool is designed to force and hold the hard surface material with a radium bend at the corner of the floor and wall surface. The radius bend is necessary because a sharp right angle bend will cause breaking of the hard surface flooring.

3,653,125
DENTAL TREATMENT ASSEMBLIES
Erich Heubeck, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Erlangen, Germany
Filed Oct. 20, 1969, Ser. No. 867,513
Claims priority, application Germany, Oct. 26, 1968, P 18 05 514.6
Int. Cl. A61c 19/02
U.S. Cl. 32—22 2 Claims



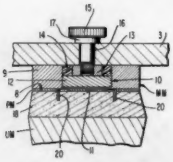
A dental treatment assembly comprises a patient's chair and a dental treatment unit supported by the chair which is mounted on a base for adjustment in a generally vertical direction relatively to the base. The dental treatment unit includes a housing connected to the chair for movement lengthwise of the chair, a rigid dental hand appliance support arm pivotably connected to the housing and releasable locking means for locking the treatment unit to the chair.

3,653,126

DENTAL ARTICULATOR MODEL MOUNTING MEANS

Gorm P. Hansen, 4701 North Federal Highway, Fort Lauderdale, Fla.

Filed Apr. 29, 1971, Ser. No. 138,697
Int. Cl. A61c *11/00*
U.S. Cl. 32—32 **17 Claims**



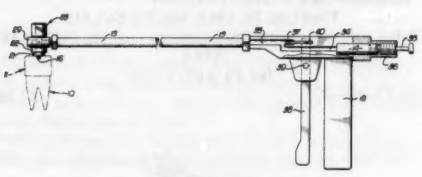
A dental model is attachable to and easily removable from a dental articulator arm by cooperating magnetic components, one fast with the arm and the other connected to the dental model. The cooperating attaching components are of wear-resistant material and are formed with interfitting aligning means. The arrangement is such that a dental model mounted on the articulator arm in a predetermined position may be detached by simply pulling the model away from the arm with sufficient force to overcome the magnetic attraction. Thereafter, the model may be replaced on the arm and positioned in the same predetermined position by the cooperation of the interfitting aligning means, and held magnetically in that position.

3,653,127

DENTAL CROWN ELEVATION

Louis M. Ballard, 1911 Wilson Avenue, Arcadia, Calif.

Filed June 9, 1970, Ser. No. 44,810
Int. Cl. A61c *3/16*
U.S. Cl. 32—43 **3 Claims**



Apparatus for removing tooth crowns (or caps or inlays) comprises a source of fluid pressure, including ducting; and, means to couple the ducting in pressure transmitting relation with the tooth side of the crown for effecting separation of the crown from the tooth in response to fluid pressure transmission to that side of the crown.

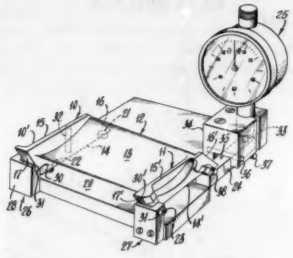
3,653,128

MEANS FOR MEASURING TWIST IN A TURBINE VANE

Edward C. Palmenberg, Nanuet, N.Y., assignor to Chromalloy American Corporation, Orangeburg, N.Y.

Filed Apr. 3, 1970, Ser. No. 25,506
Int. Cl. G01b *5/20*
U.S. Cl. 33—174 PA **16 Claims**

The invention contemplates a vane-twist measuring or gaging instrument in which the overall twist of the vane is assumed to be indicated by the angular relation between a reference alignment, taken on one buttress surface, and a measured-offset alignment, taken on the corresponding surface of the other buttress for the same vane. Basically, a reference plane is established for the reference surface of the first abutment, as by using two fixed and precisely positioned spaced point-contact elements, and a gage carried by the instrument near the other buttress senses the inclination of the other buttress (with respect to the reference plane) when the other buttress is applied against a single, or third, fixed point of support on the instrument. In one form, the third support point is established by an elongated bar, with provision for central pivotal support, so that its angular orientation about the pivot may reflect contact with, and therefore slope of, the other vane buttress; in another form, the third support point is a fixed abutment near one end of the other buttress, and a probe responds to a given location near the other end of the buttress when the vane is applied to the three fixed support contacts.

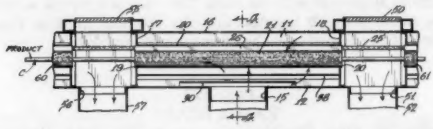


3,653,129

HEAT TRANSFER DEVICE FOR TUBULAR MATERIAL

Robert R. Seedorf, Barrington, Ill., assignor to The Roy M. Moffitt Company, Schiller Park, Ill.

Filed Mar. 10, 1970, Ser. No. 18,214
Int. Cl. F26b *13/00*
U.S. Cl. 34—155 **8 Claims**



A heat transfer device for tubular material and particularly a dryer for relatively fragile material in which a drying section of the dryer has a tubular perforate member through which the material travels and with baffles located in the chamber to cause relatively high velocity air to impinge along the entire length and about the entire periphery of the tubular material passing through the tubular member and with the air being exhausted from both ends of the tubular member to minimize the effects of air flow on the tubular member to minimize the effects of air flow on the tubular material.

3,653,130

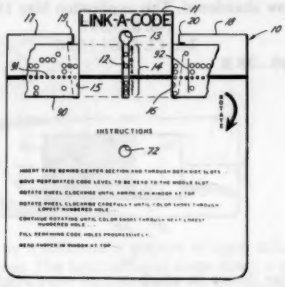
TAPE DECODER

Randall R. Geib, Altoona, Pa., assignor to Data-Link Corporation, San Mateo, Calif.

Filed Apr. 8, 1970, Ser. No. 26,618
Int. Cl. G09b *1/02*
U.S. Cl. 35—2 **3 Claims**

A device for decoding or interpreting perforated tape including a pair of members rotatably joined to each other. The first member includes slotted portions for fixing a length of perforated tape relative thereto, and a slotted section permitting a viewer to examine a discrete code level of the tape therethrough. The other member includes a set of symbols and an aligned arrangement of indicia in an array, so ar-

ranged that on rotation relative to the first member, various of such indicia will be positioned relative to the first member's slotted section. The indicia is so arranged that when



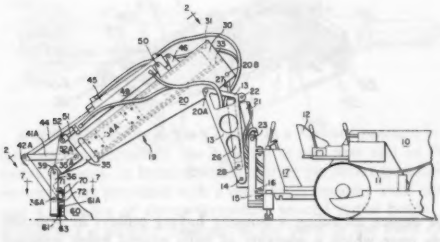
perforations in the tape are initially superimposed over the appropriate indicia the perforations are decoded by virtue of the aligned symbols on the other member.

3,653,131

EXCAVATING APPARATUS

John S. Pilch, Ware, Mass., assignor to Ware Machine Works, Inc., Ware, Mass.

Filed Mar. 24, 1970, Ser. No. 22,156
Int. Cl. E02f *3/64*
U.S. Cl. 37—1 **9 Claims**



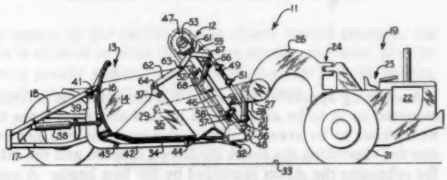
An excavating apparatus adapted for use with a grader, backhoe, loader or the like which includes an excavating implement supported from the end of a longitudinal member by an implement supporting means which is movable about a first pivot means having an axis extending in a direction transverse to the length of the longitudinal member. The excavating implement is mounted for movement about a second pivot means having an axis which extends in the plane of the longitudinal direction of the longitudinal member. The second pivot means extends between the implement supporting means and the lower part of the rear portion of the implement and this second pivot means is adjacent to the ground when the leading edge of the implement rests on the ground. The apparatus also includes means for moving the implement supporting means about the first pivot means and means for moving the implement about the second pivot means. In a preferred embodiment the means for moving the implement about the second pivot means includes a hydraulically operated reciprocating means, such as a cylinder and ram, which has one end pivotally attached to one of the excavating implement and the implement supporting means and the other end pivotally attached to the other of the implement and the implement supporting means. Also, preferably, at least the major portion of said means for moving the implement is located in the space between the rear portion of the excavating implement and the forward portion of the implement supporting means.

3,653,132

AUTOMATIC POSITIONING SYSTEMS FOR SCRAPER ELEVATORS

Trevar G. Campbell; Robert V. Larson, Peoria; Sebald K. Stahl, Peoria; Richard K. Liess, and Roger A. Rice, both of Joliet, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Original application Aug. 28, 1969, Ser. No. 852,999, now Patent No. 3,581,415, which is a continuation of application Ser. No. 656,559, July 27, 1967, now abandoned. Divided and this application July 30, 1970, Ser. No. 64,903
Int. Cl. E02f *3/08*
U.S. Cl. 37—8 **3 Claims**



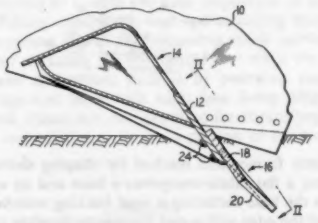
The elevator of a self-loading earth-moving scraper is moveable as a unit relative to the bowl thereof and automatic controls are provided which shift the elevator at predetermined stages in the operating cycle of the scraper. The automatic controls operate by sensing forces which react on other components of the scraper and which are indicative of the need for shifting the elevator. The elevator may, for example, pivot gradually upward as loading progresses or may be raised substantially prior to load ejection without requiring control of these movements by the operator.

3,653,133

REPLACEABLE CUTTING EDGE AND TOOTH FOR EARTHMOVING MACHINES

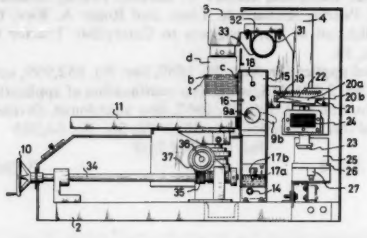
William J. Black, Wilmington; William L. Holmstrom, Joliet; Richard K. Liess, Joliet, and Max J. Teasdale, Joliet, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed May 26, 1969, Ser. No. 827,655
Int. Cl. E02f *9/28;* **A01b** *23/02*
U.S. Cl. 37—142 **8 Claims**



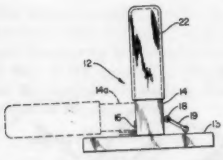
A cutting edge for an earthmoving machine made in small replaceable modules each of which has a tooth-like portion extending forwardly therefrom so that replacement of worn parts can be done very economically.

3,653,134
CREASING APPARATUS FOR GARMENTS
Seiiti Oji, Tokyo, Japan, assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Aug. 26, 1970, Ser. No. 67,182
Int. Cl. D06f 71/34
U.S. Cl. 38—14 8 Claims



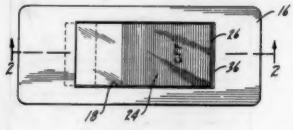
A creasing apparatus including a boiler which is pivotally mounted so as to be able to turn toward and away from the workpieces to be creased. The boiler contains two heaters, one for vaporizing the water contained therein, and the other for reheating the steam produced by the first heater. A cooling tube, connected to a blower, has air blast bores opening toward the workpieces for automatically cooling them at the end of the heating operation. Both the heating and the cooling operations continue for lengths of time which are predetermined by separate timers. The workpieces are mounted on a liftable table, and a stop is provided above the liftable table whereby the intensity of the pressure being exerted upon the workpieces is observable. One of the timers for the heating operation is equipped with an electromagnetic clutch which, when the boiler is exhausted of its water content with the consequent automatic stopping of the timer and the two heaters in the boiler, is still supplied with current to retain the timer pointer at its position indicating the lapse of time to that precise moment.

3,653,135
SET-IN SLEEVE FORMER
Helen S. Jones, 2512 South University, Denver, Colo.
Filed May 18, 1970, Ser. No. 38,099
Int. Cl. D06f 81/00
U.S. Cl. 38—135 1 Claim



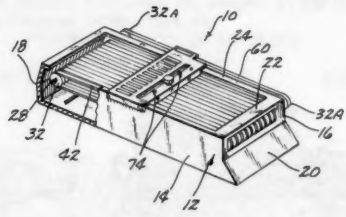
A fabric former and method for shaping sleeves and the like from a flat fabric comprises a base and an upright support on the base including a rigid backing member having a rounded top edge with a pad thereon to simulate curvature of the shoulder cap. The pad is marked with indicia for a particular armhole size. The cut fabric also has indicia for a particular armhole size which is first aligned with the indicia on the pad and then pinned in place thereon. Repeated steam-pressing and drying shape the cut fabric of the desired curvature while being held in place on the former.

3,653,136
ROCKER ARM PRISM DISPLAY
Albert L. Ruppert, Middleton, Wis., assignor to Oak Electro/Netics Corp., Crystal Lake, Ill.
Continuation-in-part of application Ser. No. 747,717, July 25, 1968, now abandoned. This application May 19, 1969, Ser. No. 825,897
Int. Cl. G09f 11/00
U.S. Cl. 40—28 R 11 Claims



A display device in which one or more prisms are moved between at least two fixed positions. Each prism has an image surface, an object surface and a reflecting surface and there is indicia placed adjacent the path defined by movement of each object surface. The indicia is visible at an image surface in only one position of the prism.

3,653,137
COMPUTER
Richard S. Hansen, 675 44th Street, Des Moines Iowa
Filed Mar. 9, 1970, Ser. No. 17,543
Int. Cl. G09f 11/28
U.S. Cl. 40—96.5 7 Claims

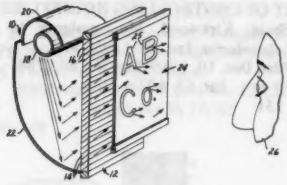


A device including a housing having pulleys at opposite ends over which a plurality of belts extend being exposed along their substantial length on the top side. A slider having an opening extending transversely of said belts is movable over the belts. Chronological information is provided on the belts and may be viewed over a substantial period of time through the top of the housing or for one unit of time in the viewing opening in the slider. One of the belts is provided with projection measuring indicia and is movable with the slider to measure into the future and into the past relative to the point of time registering in the viewing opening in the slider. Provision is made for positioning a belt outside of the housing so that belt substitution may be readily achieved. A clamping means is provided on the slider for engaging all the belts to move them with the slider to expose information on the bottom side of the belts.

3,653,138
CONTRASTING BACKGROUND DISPLAY
Irvin J. Cooper, White Bear Lake Township, Ramsey County, Minn., assignor to Minnesota Mining and Manufacutring Company, St. Paul, Minn.
Filed Apr. 13, 1970, Ser. No. 27,843
Int. Cl. G09f 13/06
U.S. Cl. 40—130 R 3 Claims

Contrasting background for display of letters, numbers, or other indicia is provided by using a sheet of louvered materi-

al in which thin parallel opaque louvers are set in a transparent matrix at an angle to the faces of the sheet. Light is made to pass through the louvered sheet generally parallel to the louvers at an angle to the faces of the sheet to display indicia defined by a differential pattern of light diffusive and transparent areas. The light diffusive areas direct a portion of the incident light to an observer while the louvers are seen in contrast through the transparent areas.

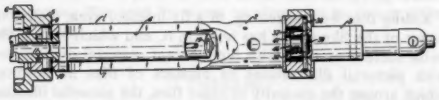


3,653,139

FIRING MECHANISM FOR EXPLOSIVELY ACTUATED TOOL

Ernest E. Temple, Murrysville, and George E. Heckathorne, Pittsburgh, both of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Nov. 3, 1970, Ser. No. 86,565
Int. Cl. B25c *1/10*
U.S. Cl. 42—1 R **10 Claims**



A spring normally holds a sleeve in a forward position in a housing. Supported by the housing in the rear end of the sleeve is a stop, in front of which a firing pin driver is slidably mounted and provided with a rearwardly opening axial bore and a plurality of circumferentially spaced radial holes. A shuttle rod is slidably mounted in the bore, in the front end of which there is a spring normally holding the rod in a rear position in the driver. A spring in the sleeve normally holds the driver in a forward position spaced from the stop. The inside of the sleeve has a recess opposite the driver holes, and a detent in each hole engages the shuttle rod and projects into the adjacent recess. The rod has a depression behind the holes deep enough to receive the detents when they are not projecting into the recess. A trigger retracts the sleeve in the housing to pull the detents and driver backward until the detents enter the rod depression to permit the driver spring to move the driver and rod forward together to fire a cartridge. When the trigger is released, the sleeve spring moves the sleeve forward so that the sleeve recess can receive the detents again to thereby permit the shuttle spring to return the shuttle rod to its rear position.

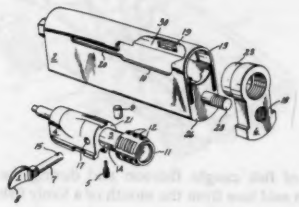
3,653,140

FIREARM RECEIVER MECHANISM WITH A ROLLER DETENT PIN FOR A TELESCOPIC BREECH-BOLT

James M. Alday, Williamson, N.Y., assignor to Remington Arms Company, Inc., Bridgeport, Conn.

Filed May 4, 1970, Ser. No. 34,145
Int. Cl. F41c *11/06, 11/00*
U.S. Cl. 42—16 **1 Claim**

A receiver mechanism for a firearm which provides for the proper engagement of the locking lugs of the bolt with the locking abutments of the receiver. A roller-type pin acts as a detent to keep the bolt fully extended from the carrier when the bolt is open, so that the bolt lugs remain aligned with the locking abutments positioned in the fore-end of the receiver.



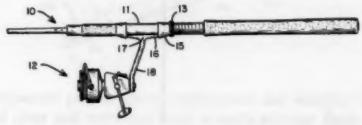
On return of the carrier to the closed breech position, the bolt is allowed to close fully before starting to rotate, thus insuring precise engagement between the lugs and the locking abutments so proper locking can take place.

3,653,141

FISHING REEL MOUNT

James T. Rumbaugh, Spirit Lake, Iowa, assignor to Berkley & Company, Inc., Spirit Lake, Iowa

Filed Jan. 30, 1970, Ser. No. 7,111
Int. Cl. A01k *87/06*
U.S. Cl. 43—22 **15 Claims**



In combination with fishing reel means for dispensing and re-winding fishing line and having winding handle means for actuation thereof; a mounting foot means comprising a mounting shank portion with shoe means extending generally transversely of said mounting shank portion disposed at one end thereof, the shoe means preferably having generally symmetrical end portions for attaching to the reel mounting portion of a fishing rod handle, the mounting shank portion and said shoe means presenting an asymmetrical disposition for said reel attaching means along the axial extent of said reel-mounting portion to control the axial disposition of said reel along said fishing rod handle, and reel-attaching means adjacent the opposed end of said mounting shank portion having means for mounting the reel on the foot while the foot is in either axial disposition, such as by providing mounting means on opposed faces with each face being adapted to receive a reel. Means are also provided for controlling the "tilt" of the reel relative to the shoe portion of the mounting foot.

3,653,142

FISHING LURE

William M. Finch, 3221 East Oregon, Phoenix, Ariz.

Filed July 22, 1970, Ser. No. 57,231
Int. Cl. A01k *85/00*
U.S. Cl. 43—42.06 **8 Claims**

A fishing lure having a substantially rigid body provided with a substantially rigid loop structure rigidly coupled to

said forward end of said body, said loop structure defining a finger-receiving opening for handling said lure during the

landing of fish caught thereon and during the removal of hooks on said lure from the mouth of a lively fish.

3,653,143

TACTILE INDICATOR FOR FLY LINE

Leon L. Martuch, Midland, Mich., assignor to Scientific Anglers Inc., Midland, Mich.

Filed Sept. 9, 1970, Ser. No. 70,678
Int. Cl. A01k *91/00*
U.S. Cl. 43—44.98 **9 Claims**

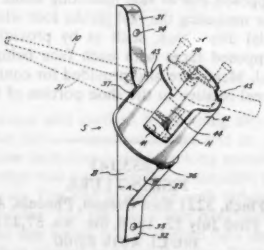
The invention relates to a tactile indicator on a fly casting line to indicate to a fisherman before the initial cast or when the line is being retrieved that the desired casting length of line is extended beyond the tip of the fly rod and that the rod and line are ready for casting.

3,653,144

FISHING ROD AND REEL STORAGE DEVICE

Arthur J. Rocks, Box 276, Route 1, Tomball, Tex.

Filed Apr. 23, 1970, Ser. No. 31,280
Int. Cl. A01k *97/00*, *97/10*
U.S. Cl. 43—54.5 **7 Claims**



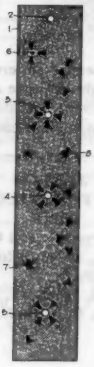
Fishing rod and reel storage apparatus wherein the reel of the fishing rod is situated in a confining holder with an opening insertion and removal of the reel from the holder easily and quickly. The holder is positioned at an angle to a supporting bracket and the fishing rod extends through the space formed by the angle.

3,653,145

ART OF CONTROLLING HOUSEFLIES

Daniel M. Stout, Kirkwood, Mo., assignor to Whitmire Research Laboratories, Inc., St. Louis, Mo.

Filed Dec. 10, 1969, Ser. No. 883,788
Int. Cl. A01m *1/20*
U.S. Cl. 43—131 **14 Claims**



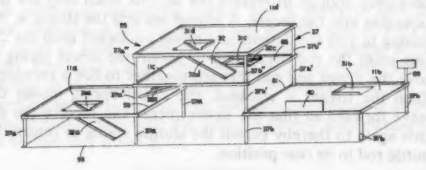
Killing flies by suspending, in a fly-infested area, a strip of paper or the like which has holes in it, and which has an obverse surface colored with luminescent material overprinted with pictorial illustrations of clusters of flies in postures which arouse the curiosity of other flies, the pictorial illustrations and the luminescent coating on the strip being intervened by white fields of substantially similar perimetrical contour as the flies in the pictorial illustrations; and the obverse surface of said strip carries fly food-toxin which may also be colored with luminescent material.

3,653,146

MODULAR TOY

Adolph E. Goldfarb, 4614 Monarca Drive, Tarzana, Calif.

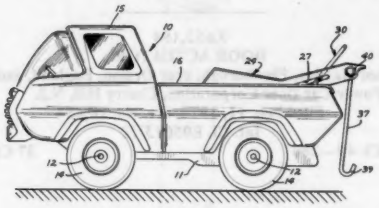
Filed Feb. 25, 1971, Ser. No. 118,781
Int. Cl. A63h *33/06*
U.S. Cl. 46—17 **16 Claims**



A modular toy which can be used to form toy parking garages, service stations and the like for playing with toy vehicles. The toy comprises a plurality of flat solid panels, each having a top support surface and a plurality of apertures formed therethrough about is periphery, and separate columns which can be seated in the apertures to support the panels above a base surface and above each other in a stacked relationship. Each panel further has an enlarged opening therethrough and means for retaining a ramp at one

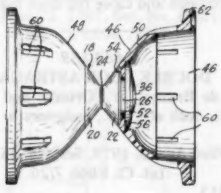
edge of the opening, the ramp extending downwardly from the opening toward a lower surface. Thus, a child can erect a multi-leveled structure with a ramp extending from one level to the next in the manner of a parking garage.

3,653,147
TOY TOW TRUCK
Theodore H. Zbikowski, Plymouth; Douglas S. Jensen, and Lee J. Pfeilsticker, both of Mound, all of Minn., assignors to Tonka Corporation, Mound, Minn.
Filed Mar. 15, 1971, Ser. No. 124,220
Int. Cl. A63h *33/30*
U.S. Cl. 46—40 **5 Claims**



A toy tow truck having a hoist boom pivoted at its forward end to the truck body for raising and lowering movement with a tow bar suspended from the rear end of the boom and an upright lever having its lower end pivoted to the body and having an intermediate portion engaging a slot in the boom to raise and lower the boom as the lever is swung in fore and aft directions. The boom is locked into position by the lever which seats in its pivot sockets under internal spring tension eliminating the need for rivets or pivot pins to mount either component.

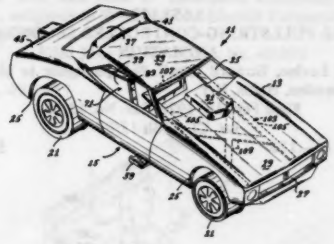
3,653,148
TOY
Henry Finkel, Montreal, Quebec, Canada, assignor to Twinpak Ltd., Dorval, Quebec, Canada
Filed Apr. 10, 1970, Ser. No. 27,311
Int. Cl. A63h *27/12*
U.S. Cl. 46—60 **7 Claims**



A diabolo toy having a center rigid cord and soft cone portions extending therefrom, and a snap-lock cap locking the soft cone portions and the cord.

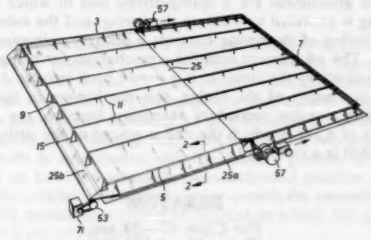
3,653,149
SIMULATED HIGH PERFORMANCE MINIATURE TOY VEHICLE
Brian S. Prodger, Torrance, and Orbert S. Smith, Hawthorne, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Sept. 18, 1970, Ser. No. 73,424
Int. Cl. A63h *17/26*
U.S. Cl. 46—201 **13 Claims**

A toy vehicle body simulating a high performance vehicle is hingedly attached to a toy vehicle chassis and a body support member is hingedly attached to the toy vehicle chassis to support the toy vehicle body above the toy vehicle chassis



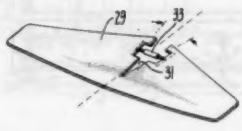
to allow the exposure of the toy vehicle's engine and interior assembly, when desired.

3,653,150
SOLAR DISTILLATION IRRIGATION APPARATUS
Lloyd V. Howard, P.O. Box 78, Keno, Oreg.
Filed Dec. 5, 1968, Ser. No. 781,404
Int. Cl. A01g *13/04*
U.S. Cl. 47—29 **1 Claim**



A transparent plastic cover constructed and adapted to be deployed over and removed from a multi-acreage field. The plastic cover is supported on an appropriate beam structure and is drawn thereover by powered means. The side panels of the plastic cover contain water tubes which are drawn through a water filled trough in the ground contemporaneously with the covering operation in order to facilitate movement of the cover over its supporting structure. Upon deployment of the cover, the trough water level is lowered so as to tighten the cover down upon the structure.

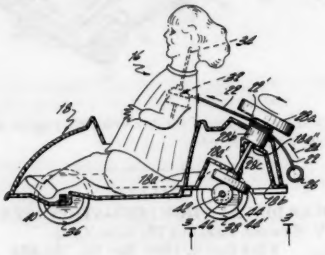
3,653,151
AIRFOIL STRUCTURE
Andre J. M. Laurent, Box 586, Los Alamos, Calif.
Continuation of application Ser. No. 764,181, Oct. 1, 1968, now abandoned. This application Oct. 13, 1970, Ser. No. 80,463
Int. Cl. A63h *27/00*
U.S. Cl. 46—76 A **3 Claims**



An airfoil is provided by distorting a relatively stiff piece of a solid material. One starts with an elongated thin, stiff

material and forms a gore in the trailing surface and then at least partially closes the gore. This distorts the thin material into a stable, airfoil configuration.

3,653,152
DOLL PULLSTRING-CONTROLLED SECONDARY ANIMATION
Richard Levine, Howard Beach, N.Y., assignor to Ideal Toy Corporation, Hollis, N.Y.
Filed Feb. 18, 1970, Ser. No. 12,284
Int. Cl. A63h *13/00*
U.S. Cl. 46—116 **5 Claims**

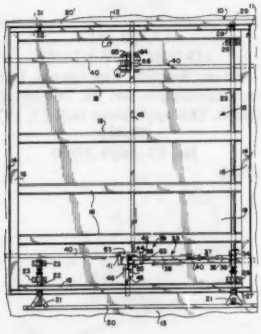


An attachment for a spring-driven doll in which a pullstring is provided to wind up the spring, and the subsequent unwinding of the spring controls a primary animation function. The attachment includes a mechanism for being driven exclusively by the string as it is drawn back into the doll during unwinding of the spring, this mechanism in turn controlling a visible secondary animation function, e.g., movement of a car in which the doll is placed or the sitting up of the doll in a carriage.

ERRATUM

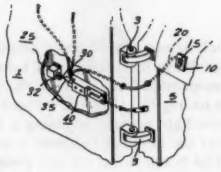
For Class 47—29 see:
Patent No. 3,653,150

3,653,153
LATERALLY MOVABLE DOOR AND OPERATING MECHANISM THEREFOR
Ernest J. Nagy, Munster, Ind., assignor to Pullman Incorporated, Chicago, Ill.
Filed Dec. 10, 1970, Ser. No. 96,810
Int. Cl. E05d *15/10*
U.S. Cl. 49—220 **13 Claims**



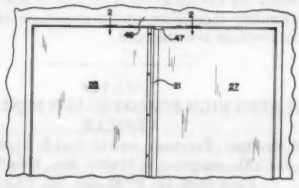
A railroad car door of a type which is laterally movable outwardly from a door opening and slidable to one side thereof includes a pipe and crank mechanism for moving the door laterally and for sliding locking bolts into engagement with a door frame to lock the same in a closed position. An operating mechanism includes a rotatable pinion drive means which is adapted to drive racks on the locking bolts for reciprocating the same. The pinion is rotatable by means of a handle lever movable in a position parallel to the door for rotating the pinion to effectuate operation of the sliding bolts. The handle is also connected to a linkage assembly which during horizontal movement rotates the pipe and crank arms for moving the door outwardly with respect to the door opening. The linkage assembly is also connected to the handle which after it has been rotated to a position opening the locking bolt is movable in another direction to effectuate operation of the pipe and crank arms.

3,653,154
DOOR ACTUATOR
William Hayday, Flawborogh, near Orston, England, assignor to Power Car Door Corporation, Cherry Hill, N.J.
Filed Feb. 11, 1970, Ser. No. 10,454
Int. Cl. E05f *15/12*
U.S. Cl. 49—280 **37 Claims**



A door actuator device to automatically, by means of a remotely actuated electrical switch, complete the opening as well as closing and locking cycle of a door. The actuator device is driven by a D. C., externally powered motor. In the opening cycle of a closed and locked door, the motor drives a latch mechanism which releases the door wherein the door lock and latch are interconnected and release of the latch also releases the lock. In the closing cycle of an open door, an automatic locking mechanism latches and locks the door member. The operator has the option of overriding the actuator device to open and close the door manually.

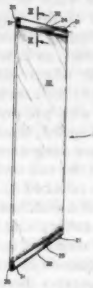
3,653,155
DOUBLE DOOR ASTRAGAL
Kops Paul F. de Brunyn, Jr., Orinda, and Victor J. Rivers, San Leandro, both of Calif., assignors to Pemko Manufacturing Co.
Filed Apr. 3, 1970, Ser. No. 25,431
Int. Cl. E06b *7/20*
U.S. Cl. 49—313 **3 Claims**



An astragal for covering the vertical seam between a pair of double doors, said astragal having a hinge portion secured

to one of said doors along the seam with a leaf portion rotatably secured to the hinge portion and spring loaded and cam actuated to automatically cover and uncover the seam when either of the doors is opened or closed.

3,653,156
GLASS DOORS
William J. Horgan, Jr., Pittsburgh, Pa., assignor to Blumcraft of Pittsburgh, Pittsburgh, Pa.
Filed Feb. 21, 1968, Ser. No. 707,055
Int. Cl. E06b *3/00*
U.S. Cl. 49—501 **2 Claims**

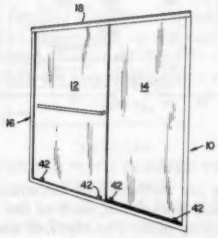


A door made of glass and metal channel members.

In one embodiment, the channel members comprise a top member and a bottom member; each being shaped to receive the glass in a shallow channel.

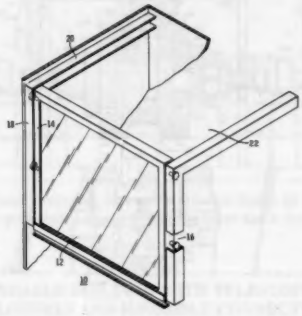
In an alternate embodiment there are four members, i.e., two side members, a top member and a bottom member. The base of each channel of the side members is held away from the glass by spacers. The channels are adhered to the glass by adhesive. The channel members have holes therein communicating the space formed by the channel with the atmosphere to cure the adhesive.

3,653,157
SLIDING GLASS DOOR ASSEMBLY
Ralph T. Casebolt, 380 Elysian Fields Drive, Oakland, Calif.
Filed June 22, 1967, Ser. No. 648,139
Int. Cl. E02d *13/02*
U.S. Cl. 49—411 **6 Claims**



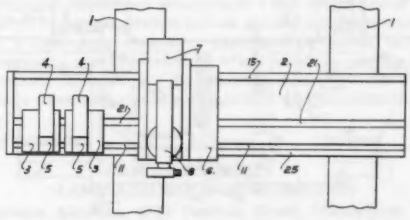
A sliding shower door assembly having a frameless glass panel provided at its lower margin with a pair of spaced bearing elements of resilient, long-wearing material. The panel is movable in a vertical plane and has its lower margin retained in a longitudinal groove of a generally horizontal guide member. The bearing elements are proximal to and bear against the sides of the groove to keep the panel out of contact with the guide member and to minimize the sound arising from the movement of the panel.

3,653,158
ARRANGEMENT FOR SUPPORTING A CLOSURE MEMBER FROM A TRACK
John R. Aue, and Glen D. Thompson, Columbus, both of Ohio, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed June 22, 1970, Ser. No. 48,055
Int. Cl. E05d *13/02*
U.S. Cl. 49—417 **8 Claims**



In the titled arrangement, a guide pin which is received by the track is assembled with a retainer with the assembly being carried by a pair of spaced-apart walls connected to the closure member and being axially displaceable relative thereto, the retainer including an arm adapted for selective engagement and disengagement with one of the two spaced-apart walls in accordance with the rotative position of the retainer to hold the assembly in an extended position with the guide member in the track, and to permit the assembly to be axially moved to a retracted position in which the guide member is out of the track.

3,653,159
CROSS-SLIDE OF A COMBINATION TOOL MACHINE, IN PARTICULAR PLANING AND GRINDING MACHINE
Gerhard Ladewig, Coburg am Bayern, Germany, assignor to Werkreugmaschinenfabrik Adolf Waldrich Coburg, Coburg am Bayern, Germany
Filed Feb. 24, 1970, Ser. No. 13,671
Claims priority, application Germany, Mar. 20, 1969, G 69 11 232
Int. Cl. B24b *7/00*
U.S. Cl. 51—5 **3 Claims**

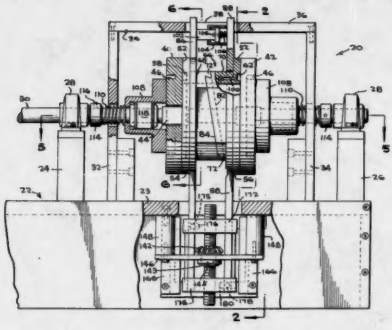


A cross-slide of a combination tool machine with separate parallel slideways for multiple supports of different working units.

3,653,160
LAPPING MACHINE AND METHOD

John A. Raickle, Hopewell Junction, N.Y., assignor to Industrial Micronics Incorporated, Leesburgh, Va.

Filed Apr. 23, 1969, Ser. No. 818,501
Int. Cl. B24b 7/02
U.S. Cl. 51—109 18 Claims

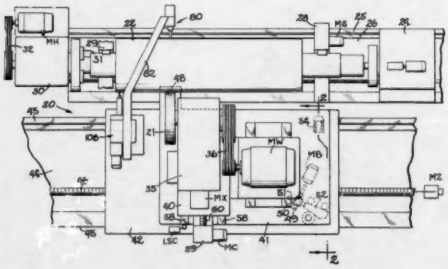


A lapping machine employing first and second lapping discs mounted coaxially for rotation and having first and second air cushion means for biassing the discs outwardly with respect to each other against the inwardly biassing force of spring means engaging the outer sides of the discs with the air cushion means being mounted for axial adjustment with respect to each other to consequently adjust the axial distance between the discs and with such adjustments being enabled by means of adjustable shift plates supporting the air cushion means and movable toward and from each other by means of first and second dovetail wedge block couples located on each end of said plates so that relative movement of the plates with respect to each other causes the plates to move toward or away from each other.

3,653,161
METHOD AND APPARATUS FOR TURNING WORKPIECES AND UTILIZING PROGRAMMED DATA

Stephen C. Clark, Jr., Phoenixville, Pa., assignor to The Ingersoll Milling Machine Company, Rockford, Ill.

Original application Jan. 10, 1969, Ser. No. 790,323. Divided and this application Jan. 25, 1971, Ser. No. 109,522
Int. Cl. B24b 5/04
U.S. Cl. 51—165 TP 11 Claims

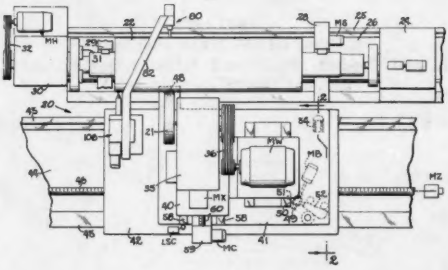


Disclosed here are methods and automatic apparatus for grinding cylindrical workpieces, such as the contoured rolls used in metal rolling mills. The methods and apparatus involve (1) automatic finding of the lengthwise center of rolls of different and undetermined lengths so as to establish a reference position for the execution of a numerically programmed path defined relative to the center of a roll as a point of symmetry, (2) the storage of the successive instructions of multi-axis movements making up a numerically defined profile or contoured path, and the use of those instructions repeatedly and in whole or in part as called for by different ones of a sequence of commands read from storage and executed in succession, (3) the automatic alignment of the roll axis parallel to the longitudinal axis of motion in a grinding machine by pivoting of one end of the roll about the other until the sensed difference in positions of the roll surface, along an axis transverse to the longitudinal axis and at locations near opposite ends of the roll, is changed to a predetermined fraction of the originally sensed difference, (4) the initiation of grinding passes from that end of a roll which is largest in diameter, so as to avoid "digging in" or increasing the depth of wheel bite as the wheel moves lengthwise of the roll, (5) the execution of continuous passes of the grinding wheel with pre-programmed values of feed rate, wheel speed, roll speed, continuous infeed and incremental infeed until a pre-programmed thickness of material has been removed from the roll surface, and (6) the grinding down of a roll until it is reduced to a diameter equal that of a previously ground roll of a matched pair. These functions are all obtained by the calling out and execution of pre-established routines in response to the reading from storage of pre-programmed sequence commands, so that in the disclosed method and apparatus there is an automatic progression from each type of operation to the next, and with the following of numerically defined profile whenever it is required.

3,653,162
APPARATUS FOR TURNING WORKPIECES

Stephen C. Clark, Jr., Phoenixville, Pa., assignor to The Ingersoll Milling Machine Company, Rockford, Ill.

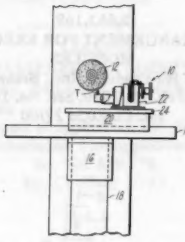
Original application Jan. 10, 1969, Ser. No. 790,323. Divided and this application Jan. 25, 1971, Ser. No. 109,525
Int. Cl. B24b 5/04
U.S. Cl. 51—165 TP 8 Claims



Disclosed here are methods and automatic apparatus for grinding cylindrical workpieces, such as the contoured rolls used in metal rolling mills. The methods and apparatus involve (1) automatic finding of the lengthwise center of rolls of different and undetermined lengths so as to establish a reference position for the execution of a numerically programmed path defined relative to the center of a roll as a point of symmetry, (2) the storage of the successive instructions of multi-axis movements making up a numerically defined profile or contoured path, and the use of those instructions repeatedly and in whole or in part as called for by different ones of a sequence of commands read from storage and executed in succession, (3) the automatic alignment of the roll axis parallel to the longitudinal axis of motion in a

grinding machine by pivoting of one end of the roll about the other until the sensed difference in positions of the roll surface, along an axis transverse to the longitudinal axis and at locations near opposite ends of the roll, is changed to a predetermined fraction of the originally sensed difference, (4) the initiation of grinding passes from that end of a roll which is largest in diameter, so as to avoid "digging in" or increasing the depth of wheel bite as the wheel moves lengthwise of the roll, (5) the execution of continuous passes of the grinding wheel with pre-programmed values of feed rate, wheel speed, roll speed, continuous infeed and incremental infeed until a preprogrammed thickness of material has been removed from the roll surface, and (6) the grinding down of a roll until it is reduced to a diameter equal that of a previously ground roll of a matched pair. These functions are all obtained by the calling out and execution of preestablished routines in response to the reading from storage of pre-programmed sequence commands, so that in the disclosed method and apparatus there is an automatic progression from each type of operation to the next, and with the following of numerically defined profile whenever it is required.

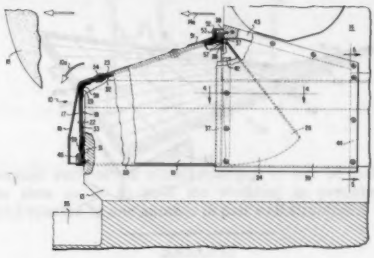
3,653,163
MACHINE TOOL GRINDING FIXTURE
Louis J. Evon, P. O. Box 4, Watertown, Conn.
Filed Mar. 10, 1970, Ser. No. 18,105
Int. Cl. B24b *19/00*
U.S. Cl. 51—218 R **8 Claims**



A fixture for refacing rectangular, cylindrical, or circular cutting tools with angled and curved surfaces including a radius device having a holder mounted for radial adjustment upon a rotary shaft and also having rotary adjustment in the plane of the shaft.

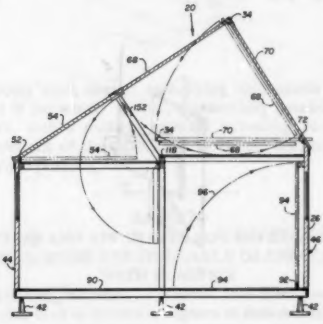
3,653,164
SLIDE FENDER WITH FORMED FLEXIBLE PROTECTOR
Ralph E. Price, and Kurt M. Riebel, both of Waynesboro, Pa., assignors to Landis Tool Company
Filed June 12, 1970, Ser. No. 45,652
Int. Cl. B24b *55/04*
U.S. Cl. 51—268 **12 Claims**

A fender assembly (10) secured to a slidable member (14) of a machine tool, such as the wheelhead of a grinding machine, to seal and protect the guide ways (11,12) of a stationary slide (13). The assembly includes a formed flexible protector (17) mounted between inner and outer fenders (18, 19). The slide fender assembly (10) is pivotally secured to the wheelhead (14) and the stationary slide (13) and rotates in a counterclockwise direction to cover the ways when the grinding wheel is advanced for stock removal. The flexible protector (17) is molded of urethane or other



moisture-proof material, to enable its thin walls to flex by a rolling loop principle to take up and release slack material.

3,653,165
EXPANDABLE BUILDING WITH TELESCOPING ENCLOSURES AND HINGEDLY CONNECTED BARRIERS
Charles A. West, 232 Jerome Avenue, Carle Place, N.Y.
Filed Apr. 22, 1970, Ser. No. 30,896
Int. Cl. E04b *1/344, 1/348, 1/36*
U.S. Cl. 52—67 **2 Claims**

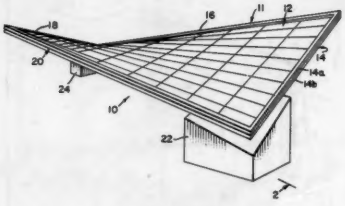


A building formed of at least two sections expandable from a compact, telescoped arrangement which is convenient for storage and transportation into an erected condition bounding a cabin-type enclosure, each section further having cooperating roof constructions which unfold to provide the necessary headroom for the enclosure and which also contribute a desirable gabled appearance to the completed building.

3,653,166
LAMINATED ROOF CONSTRUCTION
Solomon Kirschen, 1727 Danford Street, Philadelphia, Pa.
Filed Nov. 18, 1969, Ser. No. 877,605
Int. Cl. E04b *7/10;* **E04d** *3/02*
U.S. Cl. 52—80 **3 Claims**

A roof construction comprised of a shell having a hyperbolic paraboloid configuration defined by a pair of superimposed plywood layers, each layer being comprised of a plu-

rality of substantially flat plywood segments joined together at contiguous surfaces to form two sets of joints. In each layer the joints of one set are perpendicularly disposed to the joints of the other set, and each set of joints in one layer is



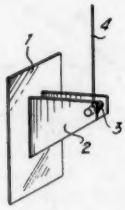
substantially parallel to, and laterally offset from a corresponding set of joints in the other layer. Edge beams are joined to the shell about the outer periphery thereof, and are supported by diametrically opposed buttresses.

3,653,167

ANCHORAGE APPARATUS

Louis F. Menard, Paris, France, assignor to Techniques Louis Menard, Longjumeau and Compagnie Francaise des Petroles, Paris, France

Filed Jan. 29, 1970, Ser. No. 11,249
Claims priority, application France, Feb. 7, 1969, 6902928
Int. Cl. E02d *5/80*
U.S. Cl. 52—162 **6 Claims**



For an anchorage in the ground, an anchoring head is provided which can be driven into the ground in an orientation providing a small frontal area and small resistance to the driving-in force. Attached to the head at a point laterally offset therefrom is a rod or cable through which the anchoring force is to be transmitted. When the head has been driven in to the anchorage depth, tension is applied to the rod or cable which, by virtue of said offset, tilts the head into a different orientation in which it presents much greater resistance to pull-out forces.

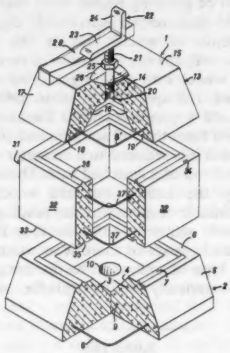
3,653,168

TRAILER PIERS

Elbert W. Cook, 5461 Eastside Road, Redding, Calif.

Filed May 11, 1970, Ser. No. 36,859
Int. Cl. E02d *5/52, 27/48*
U.S. Cl. 52—294 **1 Claim**

Trailer piers of separate elements interengageable in superposed relation in vertical alignment in different numbers from one pair to a plurality of adjacent pairs to provide piers of different heights. In each instance the pier so formed provides convergently upwardly extending side walls, a broad, horizontal lower ground-engaging surface, a smaller, but relatively large upper wall centrally apertured for a conventional



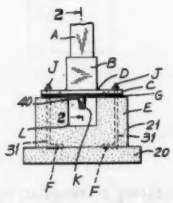
vertical, trailer-engaging bolt and height-adjusting nut, which upper wall is adequate for supporting a set of wedges for rigidly supporting the trailer independently of said bolt after the trailer has been levelled.

3,653,169

MOUNTING ARRANGEMENT FOR ERECTED BUILDING MODULES

Myron Jenner, c/o Jen Products, Inc., Bethel, Vt.

Filed Feb. 11, 1970, Ser. No. 10,342
Int. Cl. E02d *27/00*
U.S. Cl. 52—296 **10 Claims**

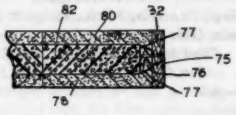


Legs of modular components of building structures, in the form of hollow columns of rectangular cross-section, are anchored to a base by having their lower ends received in sockets rising from that base. Within each socket, which may be designed to accommodate one or more columns, two pyramidal spreaders with oppositely sloping surfaces are coaxially disposed above and below a median plane within each column end and are positively engaged, via dovetail couplings, with respective sets of wedge-shaped shoes contacting their outer surfaces; a turnbuckle-type leadscrew, passing axially through these spreaders, engages them with two oppositely threaded stem portions to move them toward or away from each other while the shoes are held by tension springs against an interposed annular spacer. Rotation of the turnbuckle in a predetermined direction thus moves the shoes apart and against the column walls upon which they bear via narrow ribs, thereby clamping the column in position within the socket.

3,653,170
INSULATED MASONRY BLOCKS

Addison C. Sheckler, Bonta Bridge Road, Cato, N.Y.

Continuation of application Ser. No. 141,174, Sept. 27, 1961, now abandoned. This application Nov. 2, 1966, Ser. No. 591,651
Int. Cl. E04b *2/02, 1/64*
U.S. Cl. 52—375 4 Claims

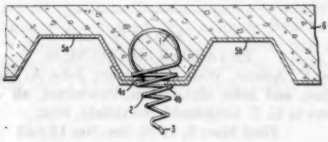


A wall construction having a plurality of contiguous courses of contiguous blocks adhesively secured to each other, each block comprising external and internal solid load bearing masonary portions with an intervening cellular heat insulating organic foam material portion bonded therebetween, wherein the thicknesses of the inner, outer, and intervening portions are substantially the same, and wherein a filamentary reinforcing grid composed of a plurality of closely spaced lengthwise extending filaments in two groups overlying successive internal and external portions of the blocks and low heat conducting cross ties for the filaments and extending across the cellular block portion in selected courses of the blocks in the wall. A moisture and heat sealing head may be applied between the courses and at the block ends within a course in the area of the cellular foam.

3,653,171
SPIRAL WIRE FASTENER FOR SHEETS OF MATERIAL

James M. Galloway, Bethlehem, Pa., assignor to Bethlehem Steel Corporation

Continuation-in-part of application Ser. No. 760,308, Sept. 17, 1968, now abandoned. This application June 18, 1969, Ser. No. 839,776
Int. Cl. E04d *3/365*
U.S. Cl. 52—521 2 Claims



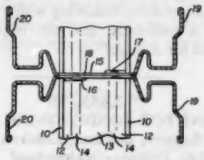
A wire fastener for tightly holding together, and anchoring to a concrete slab, overlapping portions of metal sheets used as sections of a permanent concrete form. A portion of the wire forms a spiral which is screwed into coinciding holes in the overlapping portions of the sheets whereby adjacent turns of said spiral frictionally engage the outer sides of the outermost of said sheets. The wire also has a loop extending from the large end of the spiral which provides means for turning said spiral. Wireway ducts interposed between the metal sheets may also be held in place by the wire fastener.

3,653,172
METAL STUDDING WALL STRUCTURES

Paul Schwartz, 249 Brainard Drive, Youngstown, Ohio

Filed Jan. 30, 1970, Ser. No. 7,091
Int. Cl. E04c *3/40*
U.S. Cl. 52—669 2 Claims

A wall structure comprising a spacing channel having a cross sectional configuration defining an elongated channel with a secondary channel formed axially thereof and provided with evenly spaced transversely extending slots positioned horizontally through a plurality of metal studding so as

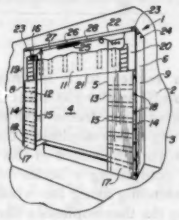


to engage each of the metal studdings in one of said transverse slots so as to hold the studding in predetermined spaced relation to one another in pair wall structure.

3,653,173
LOADING DOCK SHELTERS

Cyril P. Frommelt; and Sylvan J. Frommelt, both of Dubuque, Iowa, assignors to Dubuque Awning & Tent Company, Dubuque, Iowa

Filed Dec. 3, 1969, Ser. No. 881,703
Int. Cl. E04b *1/343;* E06b *1/04*
U.S. Cl. 52—173 7 Claims

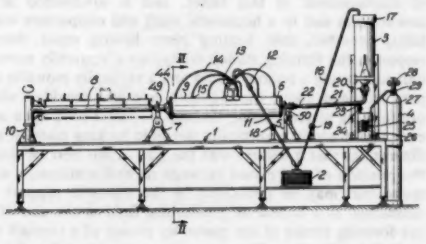


A loading dock shelter embodying side panels normally disposed in outwardly spaced, substantially parallel relation to a wall, with a resilient member extending between the upper portions of the panels for yieldingly holding them in such normal position.

3,653,174
METHOD AND APPARATUS FOR IMPREGNATING FABRICS, MORE PARTICULARLY GLASS CLOTHS, WITH PLASTICS

Andre Violleau, Vitrolles Le Roucas, and Rene Louis Coffy, Marseille, both of France, assignors to Sud-Aviation Societe Nationale de Constructions Aeronautiques, Paris, France

Filed Dec. 18, 1969, Ser. No. 886,198
Claims priority, application France, Dec. 12, 1968, 178866
Int. Cl. B65b *55/22*
U.S. Cl. 53—21 7 Claims



A method for impregnating fabrics, more particularly but not exclusively glass cloths, with plastics such as synthetic

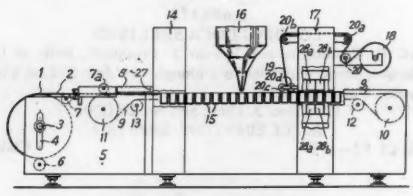
resins still in the fluid state, wherein a roll of the fabric is first subjected to the action of a substance intended to enhance the intimacy of the bond between the fibers and the impregnating plastic, and is thereafter exposed to a vacuum together with said plastic, following which the plastic content of the fabric is calibrated and the impregnated fabric is finally packaged for storage.

3,653,175

MACHINE FOR CONDITIONING PACKINGS

Etienne Marie Rogiers, Daknam, Lokeren, Belgium, assignor to Intercan S.A., Fribourg, Switzerland

Filed Jan. 14, 1970, Ser. No. 2,908
Claims priority, application Belgium, Jan. 21, 1969, 69004
Int. Cl. B65b *47/02, 47/08*
U.S. Cl. 53—184 **10 Claims**



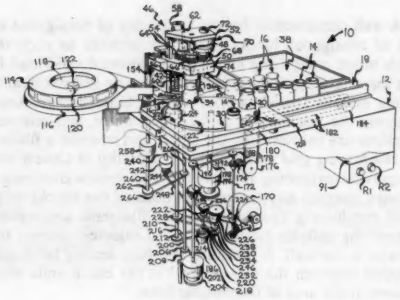
This invention relates to a machine for conditioning packings of foodstuffs and/or pharmaceutical products, comprising on the same fixed frame and mounted in series, a roller for supporting a thermoplastics film, a mechanism for guiding and conveying the edges of the thermoplastics film, said mechanism comprising a series of clips mounted on endless chains extending along the whole of the machine, a station for heating the thermoplastics film, a station for forming containers from the thermoplastics film, a filling station for loading the containers with the material to be packed, a welding station for closing a covering sheet over the filled containers and a station for cutting out the filled and closed containers, wherein each clip of the mechanism for guiding and conveying the thermoplastics film is constituted by a stop which is fixed with respect to its conveyor chain, the upper face of which stop is located substantially in the same plane as the lower face of the thermoplastics film and by a stop which is movable with respect to the fixed stop and urged by a spring against this latter and wherein at least one endless support chain is placed below the path of the thermoplastics film in a zone thereof located upstream of the station for forming the containers, the endless chains of the guide and conveyor mechanism and the support chain being connected to a step by step synchronism drive mechanism, the advance speed of which is sinusoidal; the heating plate of the heating station comprises resistors in the form of metal strips parallel to the thermoplastics film and perpendicular to the direction of displacement of this latter, and is articulated at its downstream end to a horizontal shaft and cooperates with a lifting member, said heating plate having rapid thermal response; the forming station comprises a vertically movable unit supporting a hollow mould and a vertically movable support arranged above the movable unit and provided with a pre-forming piston passing through a central bore open at its ends and made in a vertically movable locking plate of such dimensions that it defines with the wall of this bore, whatever the position of said piston between its end positions, a small space that may be obturated by the movable support and connected to a source of pressurized fluid at the end of the pre-forming stroke of the piston by means of a contact controlled by the movable support; a support roller for the covering sheet is arranged downstream of the filling station; and the welding tools and the cutting out tools are combined in one station only and may effect simultaneously the welding of the covering sheet on the containers filled with the material to be packed and the cutting out, at least partial, of the closed containers, said tools being arranged so that the welding of the covering sheet is carried out inside the zone where the containers are cut out.

3,653,176

APPARATUS FOR FILLING, CLOSING, AND LABELING CONTAINERS

Larry C. Gess, Samaria, Mich., assignor to Xebec Corporation, Toledo, Ohio

Filed Apr. 6, 1970, Ser. No. 25,925
Int. Cl. B65b *57/02;* **B65c** *3/16*
U.S. Cl. 53—64 **22 Claims**



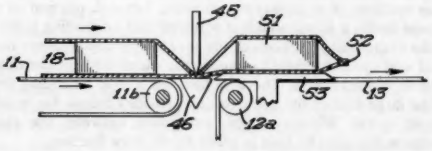
A compact, simplified machine is provided for sealing and labeling containers such as bottles. The machine is designed particularly for hospitals and the like requiring a relatively small number of one-dose bottles to provide liquid medicine for patients. Stations are provided for filling the bottles and placing caps thereon. The machine also has a station where the bottles are rotated to simultaneously crimp the caps thereon and apply labels thereto. A printing device is located on the machine which applies the proper indicia to the labels prior to being affixed to the bottles, and a unique system for feeding the labels to the bottles.

3,653,177

RETARDER MECHANISM

Richard C. Adams, West Barrington; John A. Merian, Barrington, and John McGlashan, Pawtucket, all of R.I., assignors to G. T. Schjeldahl, Northfield, Minn.

Filed Mar. 2, 1970, Ser. No. 15,660
Int. Cl. B65b *9/06, 9/12, 51/30*
U.S. Cl. 53—182 **7 Claims**



Apparatus for wrapping articles with shrinkable film and comprising, in combination, an endless article conveyor means having an article receiving end and an article delivery end, the conveyor means comprising a plurality of parallelly disposed belts having gaps formed between adjacent belts and being adapted to run continuously. Means are provided for sequentially delivering articles to be wrapped in a first predetermined spaced relationship onto the article receiving

end of the conveyor, and means provided adjacent the receiving end for applying a wrap of film about the articles being wrapped and for enclosing the articles within a tubular container or enclosure with an axis parallel to the direction of motion of the conveyor. A transverse welding and severing bar is provided for severing the film between adjacent spaced wrapped articles, and for forming a transverse welded closure about the articles, and in order to reduce the tension on the film between adjacent articles, means are provided to stop or retard the motion of each article as its trailing edge passes beyond the zone of the welding bar, this motion interrupting or retarding mechanism effectively reducing the tension in the wrapping film which would otherwise be established between the successive articles as the welding bar moves downwardly into contact with the film surfaces being sealed.

3,653,178

APPARATUS FOR CHARGING TRAYS HAVING A SURROUNDING FLANGE WITH ARTICLES ORDERED IN GROUPS

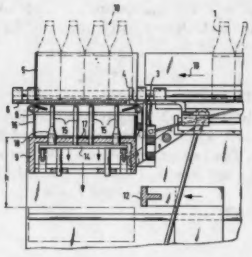
Everhard Bauer, Hudeweg 2, Paderborn, Germany

Filed Apr. 16, 1970, Ser. No. 29,233

Claims priority, application Germany, Jan. 5, 1970, P 20 00 264.6

Int. Cl. B65b *5/06, 21/04, 35/40*

U.S. Cl. 53—159 **13 Claims**



Articles are charged into the tray a group at a time. Each group of articles are pushed into a chute box having a removable bottom. The bottom of the chute box is subsequently quickly removed so that the articles of the group fall by gravity into a tray which is disposed under the chute box.

3,653,179

GREASE EXTRACTOR METHOD

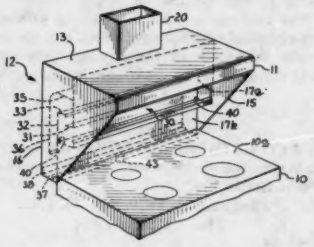
De Witt H. Doane, Long Grove, Ill., assignor to Cockle Ventilator Company, Inc., Wheeling, Ill.

Original application Oct. 2, 1967, Ser. No. 672,314, now Patent No. 3,490,206. Divided and this application June 5, 1969, Ser. No. 830,805

Int. Cl. B01d *45/12*

U.S. Cl. 55—1 **5 Claims**

A flame proof grease extraction system for removing grease, oil and other condensable contaminants from a vaporous exhaust stream in a kitchen ventilating system. The grease extraction system comprises a housing with an entranceway for receiving the exhaust stream, an outlet for discharging the exhaust stream into a duct which contains a blower or fan for drawing the exhaust stream through the extraction system, and internal baffle means for guiding the exhaust stream along a predetermined path designed to provide the extracting action. The baffle arrangement includes an entrance baffle which extends rearwardly from the top of the entranceway for deflecting the entering exhaust stream rearwardly over the bottom wall of the extractor housing. A second baffle means then defects the exhaust stream upwardly from the bottom wall around the rearward edge of the entrance baffle means and forwardly over the top of the entrance baffle means toward the front wall. Third baffle means then defects the exhaust stream rearwardly from the front wall and down along the rear side of the second baffle means



to the bottom wall, and then upwardly again between the rear side of the third baffle means and the rear wall of the housing. A drain means is provided in the bottom wall of the housing for receiving the extracted grease and oil which is deposited on the internal surfaces of the system, and which runs downwardly thereover due to the heating of the internal surfaces by the adjacent cooking surface.

3,653,180

BLOCK COPOLYMER MEMBRANE FOR SEPARATING POLAR CONTAMINANTS FROM GASEOUS MIXTURES

Peter C. Juliano, Scotia, and William J. Ward, III, Schenectady, both of N.Y., assignors to General Electric Company

Filed Nov. 2, 1970, Ser. No. 86,289

Int. Cl. B01d *53/22*

U.S. Cl. 55—16 **14 Claims**

Block copolymers containing poly(oxyethylene) segments are used for the preparation of permselective membranes employed in separating polar gases from non-polar gases. Such copolymers containing poly(oxyethylene) glycol carbonate segments in polycarbonate chains are described.

3,653,181

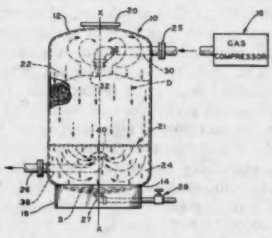
DELIQUESCENT DESICCANT GAS DRYER AND METHOD

Philip S. Becker, Erie, Pa., assignor to Van-Air Incorporated, Erie, Pa.

Continuation of application Ser. No. 808,867, Mar. 20, 1969, now abandoned. This application Mar. 9, 1971, Ser. No. 122,540

Int. Cl. B01d *53/02*

U.S. Cl. 55—35 **14 Claims**



A deliquescent desiccant type air or gas drier adapted to contain a bed of deliquescent desiccant chemical material through which the air or gas is adapted to flow, to remove

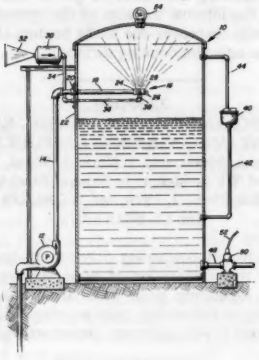
moisture from the compressed air or gas stream. The gas inlet to the drier is disposed in the upper portion of the drier housing and the gas outlet to the drier is disposed in the lower portion of the drier housing, so that the inlet air or gas flows downwardly through the bed of deliquescent chemical material, thus resulting in the deliquescent solution from the bed of chemical material flowing downwardly in the same direction of flow as the inlet air or gas. This arrangement increases the life and moisture removing efficiency of the desiccant chemical bed, increases the life of the drier, and increases the efficiency of the drying operation. A novel method of drying an air or gas stream is also provided.

3,653,182

WATER CONDITIONING METHOD AND APPARATUS

Louis S. Welch, Sunnyvale, Calif., assignor to M. Lewis Hall, Sr., Punta Gorda, Fla.

Filed Jan. 21, 1970, Ser. No. 4,720
Int. Cl. B01d *19/00*
U.S. Cl. 55—53 **16 Claims**



A method and apparatus are disclosed wherein air and water are simultaneously introduced under high pressure, concurrently upwardly, within a confined zone. Air is introduced from a point immediately below the water inlet point and travels upwardly at high velocity. Water is introduced thereabove in a manner to form extremely finely divided particles moving upwardly as a swirling mass. Because of the velocity of water and air introduction, the water droplets are driven with high impact against the upper surface of the confined zone and thereafter proceed downwardly. The impact of the water droplets against the upper surface causes them to be reshaped and broken apart, thereby providing still greater overall water-air exposure. By reason of the constant flow of high velocity air, the particles are maintained in suspension for a long period of time. Both air and water preferably are heated, especially in use under cold climatic conditions. As a result of the described mode of treatment, a high degree of water purification in various respects is accomplished. During the water and air intermingling, the water treating zone is vented for release of impurity-laden air. The particular apparatus disclosed is especially adapted for water storage, including automatic water shutoff and flow responsive to periodic water use, as may be especially desirable in home installations.

3,653,183

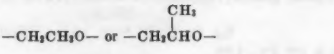
METHYL ETHERS OF POLYALKOXYLATED POLYOLS FOR REMOVING ACIDIC GASES FROM GASES

Herbert L. Sanders, Skokie, Ill.; Robert A. Swenson, and John B. Braunwarth, both of Janesville, Wis., assignors to Northern Petrochemical Company, Des Plaines, Ill.

Filed Feb. 12, 1970, Ser. No. 11,003
Int. Cl. B01d *19/00, 53/00*
U.S. Cl. 55—56 **8 Claims**

Polymethyl ethers of a polyether polyol, the polyether polyol having the formula

where R is the residue of an organic compound having three to six hydroxyls, A is 1 to 6, B is 0 to 5 and A + B equals 3 to 6 and Y is 1 to 15



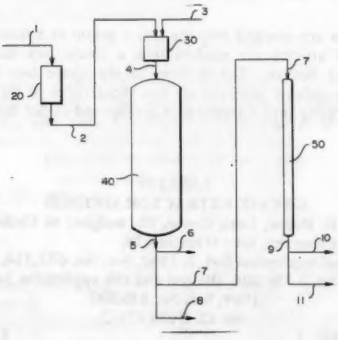
groups or mixtures thereof. Ethoxylated glycerol trimethyl ether is disclosed. The compounds are useful for extracting acid gases such as CO_2 and H_2S from natural gas.

3,653,184

SEPARATION OF C_8 AROMATICS MIXTURE WITH PRODUCTION CHROMATOGRAPHY

B. M. Drinkard; Paul T. Allen, and Edward H. Unger, all of Beaumont, Tex., assignors to Mobil Oil Corporation

Filed June 8, 1970, Ser. No. 44,459
Int. Cl. B01d *15/08*
U.S. Cl. 55—67 **12 Claims**



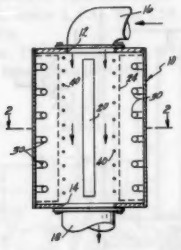
A mixture of C_8 aromatics, ethylbenzene, ortho-xylene, meta-xylene and para-xylene is separated into its component parts by production gas chromatography. The mixture is passed with a carrier in contact with a strongly polar liquid partitioning liquid to separate the ortho-xylene and ethylbenzene by different sorption rates and the remaining mixture of meta- and para-xylene is passed in contact with a certain zeolite to separate the para-xylene and meta-xylene by different sorption rates.

3,653,185

AIRBORNE CONTAMINANT REMOVAL BY ELECTRO-PHOTOIONIZATION

Harold W. Scott, Ridgefield, and Avery B. Smith, Wallingford, both of Conn., assignors to Resource Control, Inc., West Haven, Conn.

Filed Oct. 8, 1968, Ser. No. 765,763
Int. Cl. B03c 3/30
U.S. Cl. 55—103 2 Claims



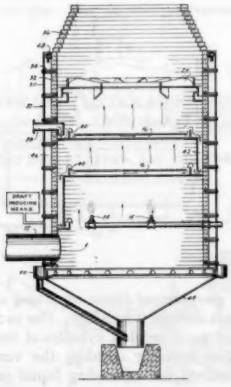
Apparatus and method are disclosed for reducing or removing particulate solid matter as well as admixed gaseous contaminants from a main stream of gas, as for example removing solid and gaseous contaminants from air. The removal is effected by the combined action on the gas stream of high intensity electrical field and electromagnetic radiation, whereby to cause electrostatic precipitation of solid contaminants and electrochemical and photochemical transformation of gaseous contaminants to elemental or non-contaminant form. The field is induced by oppositely charged electrodes causing excitation of the particulate and gaseous contaminants to a state or condition causing dark current flow and/or glow discharge between the electrodes while avoiding field-disrupting arc discharge. Concurrently with such high voltage excitation, the fluid is subjected to electromagnetic radiation, more particularly in the ultraviolet range, to produce photoionization to sustain the electrochemical and photochemical transformation.

3,653,186

WET SCRUBBER TANK

Hoyt B. McLendon, 2323 46th Street South, Petersburg, Fla.

Filed Feb. 24, 1970, Ser. No. 13,560
Int. Cl. B01d 47/06
U.S. Cl. 55—223 15 Claims



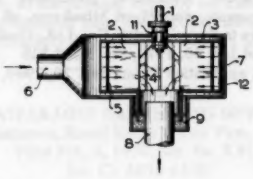
A wet scrubber system is disclosed wherein the outer metal tank of the scrubber is protected from pitting and corrosion by providing an air gap between the tank and the acid resistant inner liner. A washing solution is cascaded in the space between the tank and liner along with a counter flow of oxygen containing gas to both wash and passify the metal surface.

3,653,187

APPARATUS FOR AGGLOMERATING AND PRECIPITATING SUSPENDED MATTER OUT OF GASES AND VAPORS AND/OR FOR ABSORBING GAS COMPONENTS

Gerd Hugo Petersen, Am Birnbaum 34, Wiesbaden-Sonnenberg, Germany

Filed May 20, 1970, Ser. No. 39,097
Claims priority, application Germany, May 24, 1969, P 19 26 651.4; Feb. 19, 1970, P 20 07 547.2
Int. Cl. B01d 47/00
U.S. Cl. 55—230 19 Claims



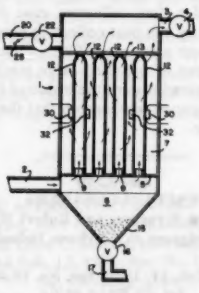
Rotatable treatment chambers arranged on a drive shaft are bounded by disk-like boundary walls and radial partition walls. The treatment chambers are arranged in a spiral housing with tangential gas inlet and axial gas outlet. The gas to be treated enters the spiral housing tangentially on its outer periphery at a high velocity, it is sucked radially through the treatment chambers, and leaves the housing purified passing through a central gas outlet. Due to the rotation of the treatment chambers by which the gas is set in rotation, a gravity field is produced whose direction is opposite to the direction of flow of the gas. Accordingly, gases and vapors to be purified receive such a high centrifugal acceleration that the suspended particles they contain, due to their centrifugal acceleration, are separated out in the direction against the flow of the gases and vapors. This effect is enhanced by additional injection of fluid. This arrangement can also be used for the absorption of gas components.

3,653,188

DUST COLLECTOR

Ervin Fisher, and Jay Warshawsky, both of Allentown, Pa., assignors to Fuller Company

Filed June 18, 1970, Ser. No. 47,466
Int. Cl. B01d 19/00
U.S. Cl. 55—283 15 Claims



A dust collecting apparatus of the filter bag type including a housing having a plurality of filter bags mounted therein. Dirty gas flows into the inside of the bags and passes therethrough to an exhaust conduit. The dust in the gas is

deposited on the inside surface of the bags. A reverse flow of clean air is used to clean the bags. This reverse flow collapses the bags and the collected dust falls into a hopper. A baffle arrangement controls the flow of clean air. Magnetically actuated reed switches mounted on some of the bags are used to control the baffle arrangement and thus the flow of clean air. In one form of the invention, a motor gradually opens a baffle in the clean air line to gradually increase the rate of clean air flow. When the bags collapse a predetermined amount, the reed switches are opened and the motor stops to thereby prevent a further increase in the reverse air flow and a further collapse of the bags.

3,653,189

VACUUM CLEANER

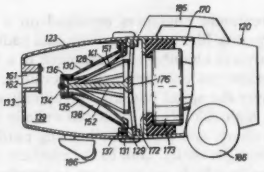
Yuji Miyake; Hideo Kashihara; Kazuyoshi Takahashi; Takamitu Yamamoto, and Ziyun Mizukawa, all of Hyogo, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

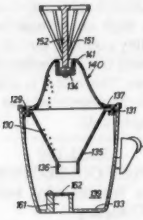
Filed Jan. 20, 1970, Ser. No. 4,328

Claims priority, application Japan, Jan. 20, 1969, 44/3995

Int. Cl. B01d *41/02*

U.S. Cl. 55—288 **10 Claims**





In a vacuum cleaner comprising a housing including a motor fan unit and a dust collecting case detachably connected to the housing, the dust collecting case is provided at its outlet opening with a two-stage filtering means comprising a conical filter screen of relatively large meshes and a cloth main filter which extend toward the inside of the dust collecting case in such a spaced relationship that the outlet opening is covered in double.

3,653,190

VACUUM CLEANERS

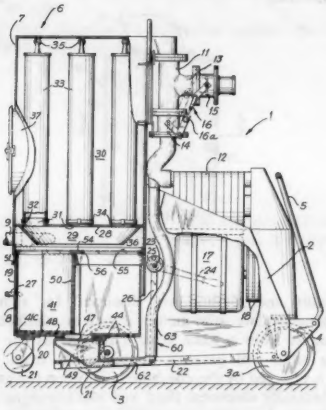
Wilfred J. Lee, East Syracuse, and Robert H. Arnold, Clay, both of N.Y., assignors to Clarkson Industries, Inc., New York, N.Y.

Filed Feb. 11, 1970, Ser. No. 10,411

Int. Cl. B01d *46/04*

U.S. Cl. 55—302 **7 Claims**

The disclosure is directed to a vacuum cleaner in which an exhauster produces a flow of dust-laden air through fabric dust bags to separate dust from the air. Collected dust is shaken from the bags by valves for alternately reversing the direction of air flow and the dust falls by gravity into at least one throwaway plastic bag in a detachable receptacle underlying the filter bags. In the preferred embodiment, the receptacle is divided into separate compartments by spaced partition walls which, together with slots in the peripheral wall of the receptacle, permit the upper edges of the bags to be folded over the top of the partition walls and tucked



downwardly therebetween. A pipe line connects the exhauster to the space between the plastic bags and receptacle walls to snap the bags to a fully open position and hold them open at all times while the exhauster is in operation. In another embodiment, the receptacle is adapted to receive a single plastic bag so as to snap it open as soon as the exhauster is initiated.

3,653,191

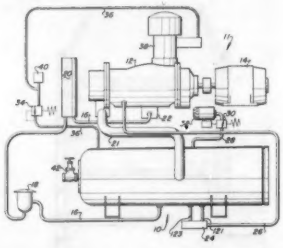
RECEIVER-SEPARATOR UNIT FOR LIQUID INJECTED GAS COMPRESSOR

Arvid L. Nelson, and Gilbert Cirrincione, both of Quincy, Ill., assignors to Gardner-Denver Company, Quincy, Ill.

Filed Oct. 16, 1969, Ser. No. 866,891

Int. Cl. B01d *50/00*

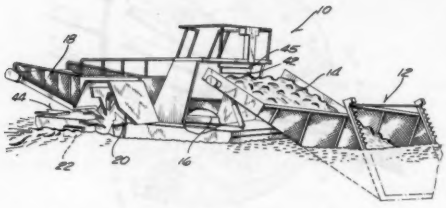
U.S. Cl. 55—310 **8 Claims**



A combination gas receiver-liquid separator unit for use in a liquid injected gas compressor system. The receiver-separator unit comprises an elongated cylindrical vessel having a transverse partition sealingly dividing the vessel into two separate compartments for separating liquid entrained in a flowing gas stream and for storing liquid-free gas under pressure. A check valve interposed between compartments prevents the backflow of liquid-free gas into the separator compartment. The separator compartment includes a primary inertial separation stage and secondary and tertiary

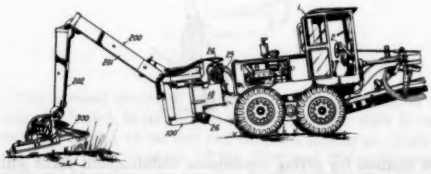
impingement type separation stages. The secondary and tertiary separation stages comprise a removable separator element. The separator compartment also serves as a liquid reservoir for the associated gas compressor system.

3,653,192
METHOD AND APPARATUS FOR HARVESTING AQUATIC VEGETATION
Charles Brate Bryant, Route I, P.O. Box 150, Wildwood Point Road, Hartland, Wis.
Filed Dec. 14, 1970, Ser. No. 97,738
Int. Cl. A01d *45/08*
U.S. Cl. 56—1 **1 Claim**



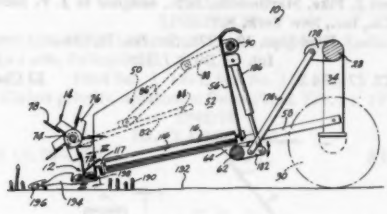
A method for harvesting and transporting large quantities of aquatic vegetation. The apparatus includes a harvesting barge provided with paddle wheels and rudders for increased control in currents and wind and a series of longitudinally extending conveyors for moving the cut weeds onto a transport barge which is coupled in tandem with the harvesting barge. To compact the weeds and eliminate the need for a transport barge operator, the transport barge has a live bed controlled by a load sensor which activates the live bed to inch the weeds aftward on the transport barge as the weeds accumulate to a predetermined height in the hold. The transport barges are moved between the harvesting site and shore unloading site by a tugboat. The apparatus also includes a high capacity portable shore conveyor assembly which is adapted for all types of shore sites and which utilizes a first conveyor which can be supported by posts on the bottom of the lake or supported by a float and which includes coupling pins for connection with the couplers of the transport barge. A wheeled second conveyor is positioned on shore under the discharge end of the first conveyor, for conveying the weeds into a truck or pile. The second conveyor may be barge mounted.

3,653,193
ROTARY CUTTER MECHANISM
Samuel J. Coughran, Jr., Cedartown, Ga., assignor to Rome Industries, Incorporated, Cedartown, Ga.
Filed Dec. 12, 1969, Ser. No. 884,547
Int. Cl. A01d *35/26*
U.S. Cl. 56—10.7 **10 Claims**



Apparatus for use in cutting vegetation located remotely from the path of travel of a support vehicle, such as vegetation located along the banks and shoulders adjacent a highway. The apparatus includes a base support housing having attachment means for permitting easy attachment of the apparatus to a support vehicle. A yoke is supported on the housing for pivotal movement about a substantially vertical axis and provides a support for a boom which is mounted for pivotal movement about a substantially horizontal axis. Hydraulic control means is operatively associated with the yoke and boom means for effecting movement of the yoke and boom means about their respective support axis. A cutter head having a rotary cutting blade is pivotally mounted for universal movement on the extended end of the boom and includes hydraulic control means for effecting pivotal movement of the cutter head about the universal mounting and for effecting operation of the cutting blade. The boom and cutter heads are supported for pivotal movement relative to the housing whereby the cutter head can be selectively positioned adjacent opposite lateral sides of the housing substantially 180° displaced relative to each other.

3,653,194
ASPARAGUS HARVESTING DEVICE
Myron C. Lachman, Rural Route 1, Paw Paw, Mich.
Filed Feb. 5, 1970, Ser. No. 8,913
Int. Cl. A01d *45/00*
U.S. Cl. 56—327 A **19 Claims**

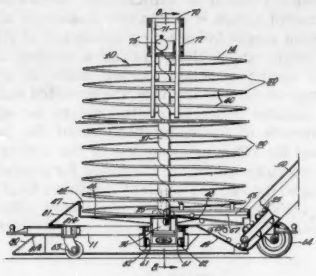


A cutter bar mounted for forward movement generally parallel to and above the surface of the ground to cut asparagus stalks at a generally uniform height, with a catcher plate disposed adjacent and generally parallel to the cutter and a rotatable reel disposed above the catcher plate to sweep over the same and thereby move the cut stalks of asparagus from the catcher to a belt-type conveyor disposed behind the cutter and catcher plate, and with an impeller for drawing foreign constituents off and away from the cut stalks while they are being conveyed, wherein the opening height of the cutter is continuously controlled by hydraulic power cylinders in response to the actual level of the ground immediately ahead of the cutter, sensed by ground-engaging runner elements coupled to a control valve for the hydraulic cylinders.

3,653,195
METHOD AND APPARATUS FOR HARVESTING FRUIT
Tatum R. Cochran, Fort Meade, Fla., assignor to Robert W. Loadholtes and Loyd C. Shirley, part interest to each
Filed Feb. 13, 1970, Ser. No. 11,190
Int. Cl. A01g *19/00*
U.S. Cl. 56—328 R **16 Claims**

Fruit depending from the branches of a tree is harvested by means of a perforated picker plate disposed helically about an upright post which is mounted for rotation on a ground-travelling frame. In the described forms, the picker plate is positively rotated. The plate has a plurality of shaped aper-

tures having enlarged leading ends which are sized to permit fruit to pass downwardly and dangle below the plate and having smaller trailing ends which are sized to prevent the same fruit from passing upwardly from below the plate. The fruit is



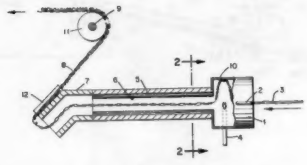
removed from its branches by means of edges at the rear of the apertures which engage between the fruit and the branches and apply tension therebetween upon rotation of the post.

3,653,196

YARN TEXTURIZING APPARATUS AND PROCESS

Herbert J. Pike, Martinsville, N.Y., assignor to J. P. Stevens & Co., Inc., New York, N.Y.

Filed Sept. 30, 1970, Ser. No. 76,936
Int. Cl. D01h *13/26*
U.S. Cl. 57—34 B **22 Claims**



Multifilament yarn, such as yarn of continuous glass fibers, synthetic fibers, and the like, is texturized by feeding it rapidly into a chamber in which it encounters a swirling flow of a fluid, preferably a gas such as air, which causes the yarn to rotate in loop form in a manner similar to a skipping rope but at an enormously greater rate. The swirling air blast is introduced tangentially just ahead of the yarn introduction, and the yarn and air then pass out axially at about 90° to the air introduction through a tube or conduit with air escape slots to eliminate swirling substantially. This causes the yarn to assume a false twist, and on untwisting opens up the individual filaments. The yarn is then doubled back on itself, which causes formation of loops, imparting to the yarn a bulk and texture.

3,653,197

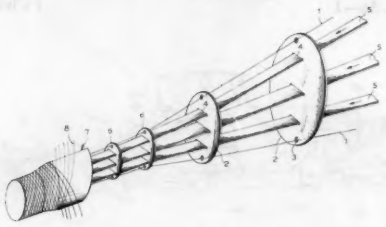
NONCIRCULAR CABLE AND METHOD OF MAKING THE SAME

Gilbert Morieras, and Michel Sere De Lanauze, both of Lyon, France, assignors to CTA-Compagnie Industrielle de Textiles Artificiels et Synthetiques

Filed Aug. 24, 1970, Ser. No. 66,491
Claims priority, application France, Sept. 1, 1969, 6929773
Int. Cl. D07b *1/10, 1/16;* **H01b** *7/18*
U.S. Cl. 57—139 **9 Claims**

A cable or cord of a noncircular cross-section composed of a multiplicity of substantially parallel core yarns covered with a textile sheath, the core yarns being bound together and the sheath being bound to the core yarns by means of an adhesive or binder, such cord or cable being characterized in that the noncircular cross-section has at least one axis of symmetry and that, along the entire length of the cord or cable, at least one reinforcing element is present normal to the axis or one of the axes of symmetry, extending over the entire width of the core.

Such cables or cords are produced by cross-section, a sheet of parallel core yarns with a binder, disposing the core yarns in the position that they will occupy in the finished



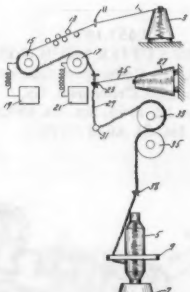
noncircular cross-section cable or cord, and covering the core thus formed of parallel core yarns with a sheath, and thereafter vulcanizing the entire assembly, such process being characterized in that the core yarns provide a noncircular cross-section with at least one axis of symmetry and, at the time of formation of the core, reinforcing elements are introduced between the core yarns, such reinforcing elements also being impregnated with a binder, the elements being disposed along the entire length of the cable normal to the axis of symmetry or to one of the axes of symmetry of the core and extending over the entire width of the core at their point of introduction.

3,653,198

METHOD FOR MANUFACTURING A PLIED YARN

John G. Hopkins, Boonton, N.J., assignor to J. P. Stevens & Co., Inc., New York, N.Y.

Original application May 10, 1967, Ser. No. 637,399, now Patent No. 3,483,690. Divided and this application Dec. 4, 1969, Ser. No. 879,965
Int. Cl. D02g *1/18, 3/04*
U.S. Cl. 57—157 MS **8 Claims**



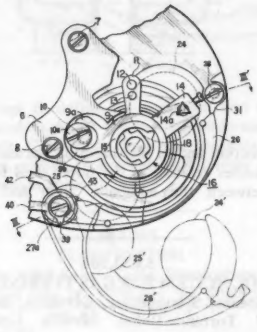
A method for plying continuous multifilament yarns with natural or synthetic yarn into a tow comprising the steps of differentially shrinking the multifilament yarn so as to form a multiplicity of yarn convolutions therein; merging the differentially shrunk filament yarn with a second yarn, and ply-

ing the merged yarns to thereby produce a plied bulk yarn having a uniform consistency along the length thereof.

3,653,199
COIL CARRIER MEANS IN AN ELECTRONIC TIMEPIECE MOVEMENT

Kazuyoshi Inoki, and Yasuaki Nakayama, both of Tokyo, Japan, assignors to Citizen Watch Company, Limited, Tokyo, Japan

Filed Nov. 10, 1970, Ser. No. 88,431
Claims priority, application Japan, Nov. 10, 1969, 44/106620
Int. Cl. G04c *3/00, 3/00*
U.S. Cl. 58—23 **5 Claims**



In an electronic timepiece the electromagnet coils which cooperate with the movable magnets mounted on the balance wheel are mounted on a frame pivoted to the base of the timepiece so as to arrange the coils for movement into and out of operative relation with the magnets. The electrical connections for the coils are made thru complimentary sliding contact members mounted about the pivot point for the frame.

3,653,200
CALENDAR WATCH WITH SEPARATE SECONDS, MINUTES, AND HOURS DIALS

Koichi Ogawa, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

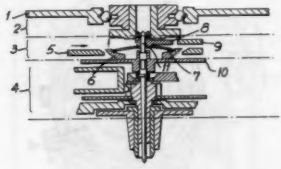
Filed Apr. 6, 1970, Ser. No. 25,715
Claims priority, application Japan, Apr. 10, 1969, 44/32042
Int. Cl. G04b *19/24*
U.S. Cl. 58—58 **1 Claim**

The present invention relates to a novel construction of a calendar watch having a plurality of indicator dials in addition to a display of the day and the date. Maximum space for the letters and numbers of the date and dial indicators is achieved by making the day dial slightly smaller than the date ring and placing the spindles of the dial indicators in the annulus between the outer periphery of the day dial and the inner periphery of the date ring.

3,653,201
SELF-WINDING CHRONOGRAPH

Koichi Ogawa, and Takao Tajima, both of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Apr. 6, 1970, Ser. No. 25,719
Int. Cl. G04f *7/04*
U.S. Cl. 58—74 **4 Claims**

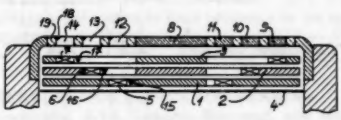


A self-winding chronograph timepiece having a clutch system positioned intermediate the self-winding system and the gear train, said clutch system having a clutch ring frictionally connected with a fourth wheel loosely fitted on the sweep second axle through the operation of a clutch spring secured to said axle. Said clutch ring is displaced out of engagement with said fourth wheel by means of a starting and stopping level responsive to the operation of a crown or button.

3,653,202
TIMEPIECE

Pierre Calame, Le Locle, Switzerland, assignor to Zodiac S.A., Le Locle, Switzerland

Filed Feb. 1, 1971, Ser. No. 111,502
Claims priority, application Switzerland, Feb. 11, 1970, 1948/70
Int. Cl. G04b *19/00*
U.S. Cl. 58—126 A **3 Claims**



A timepiece comprises three superimposed coaxial rotary discs, each disc comprising time graduations around an annular ring and an index mark spaced apart from the annular ring. The annular rings of the three discs are radially spaced from one another. A glass mounted over the discs is provided with three opaque sectors of rings, each concealing from view a part of the graduations of one disc whilst other parts of the graduations are visible through transparent sectors on the glass to give a time indication. The index marks are permanently visible through annular transparent parts of the glass to provide a double reading of the time.

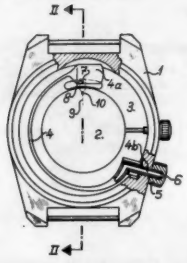
3,653,203
TIMEPIECE

Zeno Hurt, Moehlin, Switzerland, assignor to Agon Fabrique D'Horlogerie Robert Triebold SA, Mumpf, Switzerland

Filed Nov. 19, 1970, Ser. No. 91,105
Claims priority, application Switzerland, Nov. 20, 1969, 17279/69
Int. Cl. G04b *47/06;* **G01l** *7/20*
U.S. Cl. 58—152 A **3 Claims**

A timepiece for underwater use, includes a conventional movement arranged within a case and a manometer in the form of a resilient tube arranged in the space between the

movement and the inner surface of the case. An open end of the tube communicates with ambient medium around the case and pressure variations in the tube are communicated to an indicator by means of a pin mounted on the opposite closed end of the tube. The pin is arranged between two legs at one end of the indicator.



3,653,204

DIGITAL DISPLAY WORLD CLOCK

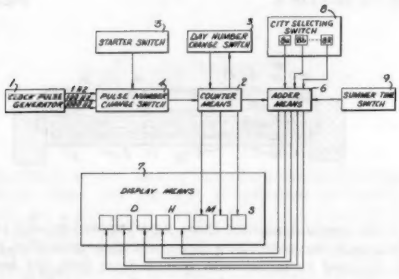
Akihiro Miwa, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed July 31, 1970, Ser. No. 60,015

Claims priority, application Japan, Aug. 20, 1969, 44/65555

Int. Cl. G04b *19/22, 19/24*

U.S. Cl. 58—42.5 **6 Claims**



A portable world clock which displays day, hour, minute and second corresponding to each city of the world by selecting a pushbutton. Adder means of an electronic computer and a quartz crystal clock are combined in this world clock, and a counter means is driven in synchronization with the time of Greenwich standard time minus 12 hours.

3,653,205

REACTOR FOR INTERNAL COMBUSTION ENGINE

Tomoo Tadokoro, Kure-shi, Japan, assignor to Toyo Kogyo Company Limited, Hiroshima, Japan

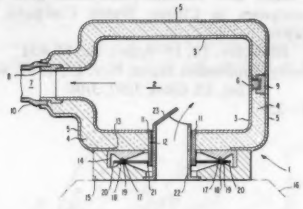
Filed Apr. 24, 1970, Ser. No. 31,635

Claims priority, application Japan, Apr. 24, 1969, 44/32152

Int. Cl. F01n *3/10;* **F16l** *51/00*

U.S. Cl. 60—29 A **17 Claims**

A reactor for purifying exhaust gas in an exhaust gas system of an internal combustion engine comprises an inner shell forming a reaction chamber and an outer shell surrounding the inner shell and defining an adiabatic zone therebetween. A pipe member extends through the outer shell to the inner shell for absorbing the heat expansion of the inner shell. The pipe member disposed for movement in the axial direction and in the direction normal to the axis of the pipe member relative to the outer shell for maintaining the seal between the adiabatic zone and the reaction chamber.



3,653,206

CONTROL SYSTEM FOR GAS TURBINE ENGINES

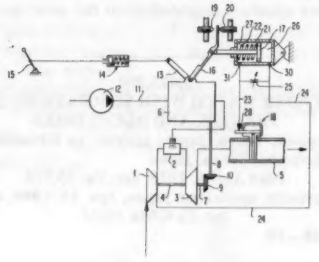
Christian Greune, Schongeising, Germany, assignor to Motoren-und Turbinen-Union Munich GmbH, Munich, Germany

Filed Mar. 31, 1970, Ser. No. 24,278

Claims priority, application Germany, Apr. 5, 1969, P 19 17 625.1

Int. Cl. F02c *9/06*

U.S. Cl. 60—39.28 **10 Claims**



A control installation for a gas turbine engine which limits the maximum temperature of the propellant gases by an adjusting device controlled by an exhaust gas temperature regulator, which influences the fuel speed regulating device.

3,653,207

HIGH FUEL INJECTION DENSITY COMBUSTION CHAMBER FOR A GAS TURBINE ENGINE

Richard E. Stenger, and Clifford C. Gleason, both of Cincinnati, Ohio, assignors to General Electric Company

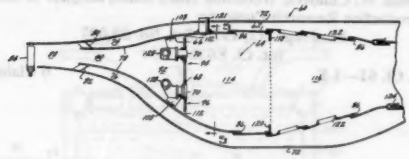
Filed July 8, 1970, Ser. No. 53,146

Int. Cl. F02c *3/24*

U.S. Cl. 60—39.65 **8 Claims**

A combustion chamber for a gas turbine engine is disclosed as having a high density, i.e., greater number than normal, of fuel injection and flame stabilization points. Addi-

tionally, a dome passageway is sized to receive and deliver directly to the combustion zone, as primary air flow, a much higher percent of total compressor discharge air at a much higher velocity than in prior art combustors of the same approximate size. A baffle is positioned transversely of the pri-



mary air passage to define the upstream end of the combustion zone and to define the fuel injection and flame stabilization points. Combining the above features results in a highly efficient, smoke free combustor having a shortened primary combustion zone.

3,653,208

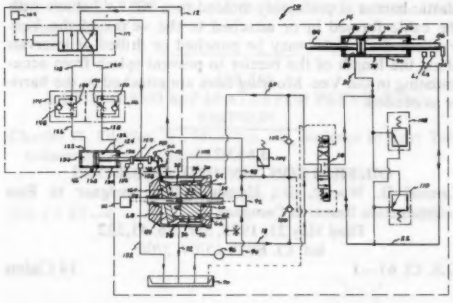
FLUID SYSTEM

Philip A. Kubik, 6809 Spruce Drive, Birmingham, Mich.

Filed June 26, 1970, Ser. No. 50,093

Int. Cl. F15b *15/18*

U.S. Cl. 60—52 VS **4 Claims**



A fluid system having a variable displacement fluid pump connected in a closed loop circuit to a fluid cylinder having a piston and a pair of connecting rods extending from opposite sides of the piston externally of the fluid cylinder. A directional control valve disposed in the closed circuit between the inlet and outlet of the fluid pump is adapted to selectively direct fluid to one side of the piston within the fluid cylinder, while exhausting fluid from the other side of the piston so as to selectively move the piston within the fluid cylinder. The rate of movement of the piston in either direction of movement is controlled by the amount of fluid displaced by the fluid pump.

A second directional control valve is adapted to direct fluid from a second source of fluid to a pressure responsive displacement control mechanism to selectively vary the displacement of the fluid pump. The rate of fluid flow to the pressure responsive displacement control mechanism is selectively varied to control the rate of displacement of the fluid pump and to thereby selectively control the rate of movement of the cylinder piston.

3,653,209

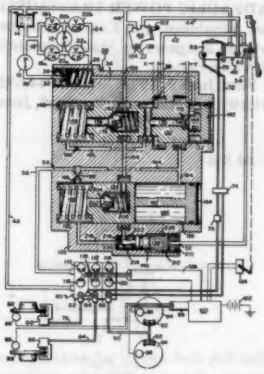
VEHICLE HYDRAULIC SYSTEM

Stanley I. MacDuff, Laverniere, Quebec, Canada, assignor to The Bendix Corporation

Filed Aug. 31, 1970, Ser. No. 68,093

Int. Cl. F15b *15/18*

U.S. Cl. 60—52 S **10 Claims**



A hydraulic system for a motor vehicle having an open center type hydraulic power brake booster, an open center type hydraulic power steering gear, and an adaptive braking system using hydraulically powered brake line pressure modulators. The system includes a control valve receiving flow from an engine driven pump and a drive shaft driven pump delivering appropriate quantities of fluid to the brake booster and steering gear. They also deliver fluid at the correct pressure to the brake line pressure modulators upon receiving a pressure signal from the brake booster. Check valves are provided in the pump discharge lines to prevent backflow through a pump in the event of failure of the pump or its drive mechanism. The system control valve also includes pressure relief valves to limit pressures in the several systems to appropriate levels.

3,653,210

SERVOMOTOR DEVICE FOR BRAKING

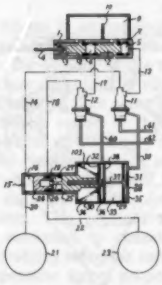
Toyoju Mochizuku, 5-10, 7-chome Roppongi, and Mamoru Watanabe, 16-9, 6-chome Takinozava, both of Tokyo, Japan

Filed Mar. 16, 1970, Ser. No. 19,838

Claims priority, application Japan, Mar. 15, 1969, 44/19335

Int. Cl. F15b *7/00*

U.S. Cl. 60—54.5 P **3 Claims**



A servomotor device for braking comprises two servo units connected so that their respective outputs may be added, one of the servo units being related to a first relay cylinder with a

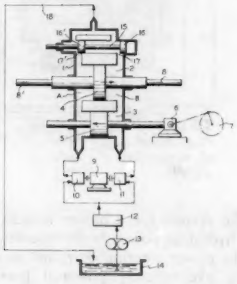
relay piston having a large effective pressure area and the other servo unit being related to a second relay cylinder with a relay piston having a small effective pressure area, whereby only one servo unit is operated at the early stage of stepping down on a brake pedal, and thereafter both of the servo units are put into operation.

3,653,211

HYDRAULIC POWER TRANSMISSION

Albert Strebel, Binningen, and Konrad Scheuber, Basel, both of Switzerland, assignors to Maschinenfabrik Burckhardt AG, Basel, Switzerland

Filed June 9, 1970, Ser. No. 44,695
Claims priority, application Switzerland, June 12, 1969, 9003/69
Int. Cl. F15b 7/00
U.S. Cl. 60—54.5 R 17 Claims



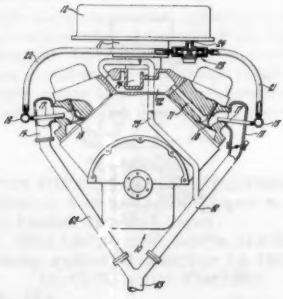
The invention concerns hydraulic power transmission or conversion between a crank-driven, double-acting primary cylinder and a similar secondary cylinder and provide for avoidance of the danger of cavitation, as a result of hydraulic fluid pressure falling below vapour pressure, by regulation of the feed pressure and of the arithmetic mean of the respective upper and lower pressures in the loaded and non-loaded working chambers, so that the lower pressure will not fall below the vapour pressure, even taking account of possible pressure oscillations. The invention extends both to methods of transmission and conversion and to devices wherein the same may be effected.

3,653,212

EXHAUST EMISSION CONTROL SYSTEM

Richard A. Gast, Southfield, and Harry R. Mitchell, Bloomfield Hills, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 30, 1970, Ser. No. 85,379
Int. Cl. F01n 3/10
U.S. Cl. 60—30 R 10 Claims



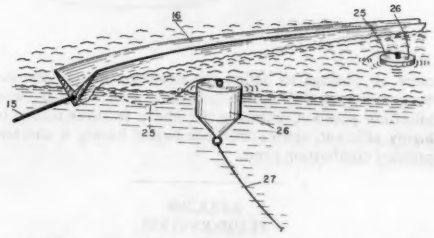
An exhaust emission control system for an internal combustion engine having an air injection system in which exhaust system pressure pulsations are used to induce air flow through an air induction valve to the engine exhaust ports to deliver air to the stream of exhaust gases as they are emitted from the combustion chambers.

3,653,213

PLASTIC OIL BARRIER

Thomas W. Childers, Woodland Hills, Calif., assignor to Esso Production Research Company

Filed Apr. 22, 1970, Ser. No. 30,697
Int. Cl. E02b 15/04
U.S. Cl. 61—1 F 6 Claims



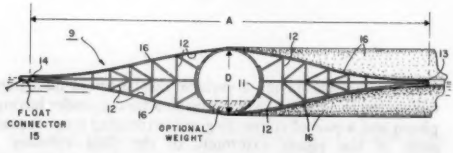
A floatable plastic barrier, molded on-site in a desired shape and secured to an elongated flexible member, is used to contain oil spills in water locations. The flexible member is a cable to which the barrier is bonded directly or attached by clips as the barrier and cable are fed onto the water. The plastic barrier is preferably molded to a 90° "V" shape with the cable formed in or attached to the vertex of the Vee. Vertical drain holes may be punched or drilled at intervals along the length of the barrier to prevent splash from accumulating in the Vee. Mooring lines are attached to the barrier as needed.

3,653,214

OIL FILM CONTAINMENT APPARATUS

Lemuel D. Woody, Jr., Houston, Tex., assignor to Esso Production Research Company

Filed May 21, 1970, Ser. No. 41,232
Int. Cl. E02b 15/04, 3/00
U.S. Cl. 61—1 14 Claims



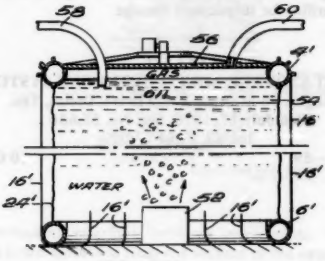
A barrier apparatus for containing oil accumulation on a water surface. An elongated buoyant member having a generally triangular cross-section with such triangle preferably having slightly rounded identical sides is arranged in the water such that a line from the vertex of the triangle perpendicular to the base thereof substantially coincides with the water level. The length of such line is several wave lengths in magnitude in order to act as a dampener to wave amplitude. The length of the base of such triangle is sufficient (in cooperation with the length of the line perpendicular to the base) to inhibit or prevent oil from flowing over the barrier member and inhibit or prevent oil from becoming trapped beneath the barrier member under normal heave thereof.

3,653,215

METHOD AND APPARATUS FOR CONFINING AND COLLECTING OIL LEAKAGE

Arturo M. Crucet, Oklahoma City, Okla., assignor to Cerebro-Dynamics, Incorporated, Oklahoma City, Okla.

Filed June 4, 1969, Ser. No. 830,276
Int. Cl. E02b *15/04, 1/00;* B03d *1/00*
U.S. Cl. 61—1 12 Claims



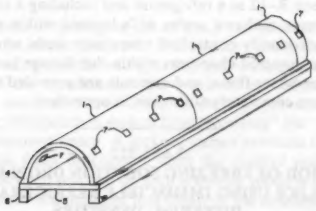
An expansible oil collector and method for isolating oil escaping from an underwater source. The collector is in the form of a buoyant ring with an anchor ring suspended below the buoyant ring by cables. A thin, flexible wall or shield interconnects the anchor ring with the buoyant ring. When the collector is positioned over an underwater source of oil leakage, the anchor ring is lowered by means of the cables on the buoyant ring until the anchor ring rests on the underwater surface and encircles the source of leakage. The fluid collects at the surface of the water in the interior of the buoyant ring.

3,653,216

METHOD AND APPARATUS FOR PREVENTING EROSION

Charles W. Stickler, Jr., Mohnton, Pa., assignor to Gray Tech Industries, Inc., Mohnton, Pa.

Filed Apr. 9, 1970, Ser. No. 26,829
Int. Cl. E02b *3/04*
U.S. Cl. 61—4 2 Claims



This invention relates to a method and apparatus for preventing erosion of beaches by tidal waves, comprising placing hollow enclosures, such as "quonset" type huts, end-to-end along the beach, with slots on the walls of the huts, and wherein the huts are so placed that incoming tidal waves will be diverted over the roofs of the huts. Incoming and outgoing waves will be retarded in velocity by flowing through said slots and sand will be deposited an ⁴ accumulated inside the huts. Reduction of wave velocity will cause deposition of sand particles as waves ride over the hut. Additionally, slots in the hut will cause incoming and outgoing waves to become retarded in velocity by flowing through said slits and sand will be deposited and accumulated inside the huts.

3,653,217

ROCK BOLT ROD CONFIGURATION

Chester I. Williams, 347 Greenbrier, S.E., Grand Rapids, Mich.

Continuation-in-part of application Ser. No. 12,221, Feb. 18, 1970. This application Aug. 3, 1970, Ser. No. 60,529
Int. Cl. E21d *20/02*
U.S. Cl. 61—45 B 10 Claims

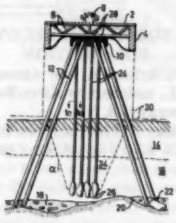
A surface configuration for a rock bolt rod defined by one or more indentations arranged generally transversely with respect to the axis of the rod, and having a maximum slope of 15° with respect to the axis of the bolt rod on the side of the indentation most remote from the surface plate of the rock bolt assembly.

3,653,218

HYDRAULIC CONSTRUCTION AND METHOD FOR BUILDING SAME

Carl T. Cappe, Enebyberg, Sweden, assignor to Nya Asfalt AB, Stockholm, Sweden

Filed Nov. 19, 1969, Ser. No. 878,065
Int. Cl. E02d *21/00*
U.S. Cl. 61—46 10 Claims

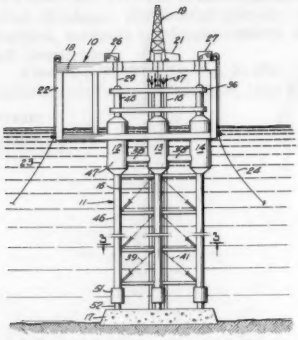


The invention relates to an improved hydraulic construction such as a quay structure, work-platform or dolphin, which is built on the bottom of the sea and comprises an above-water structure supported by supporting elements and also a method for building such constructions. The main features of the invention reside in that the construction is anchored in the bottom of the sea by means of substantially vertical prestressed elements, which are secured to anchor elements grouted under the bottom of the sea and forming a counter-balance for the tensile forces acting in the prestressed elements. This provides a stable construction which could be subjected to considerable lateral forces without losing its stability since the support elements will be subjected to compressive forces proportional to the tensile forces. The invention also provides light and simple constructions since the lateral forces acting on the construction must be resisted by big masses contained in the hydraulic construction.

3,653,219
MARINE PLATFORM

George E. Mott, Metairie, La., assignor to Texaco, Inc., New York, N.Y.

Filed Dec. 31, 1969, Ser. No. 889,379
Int. Cl. E02b *17/00*; B63b *35/44*
U.S. Cl. 61—46.5 4 Claims

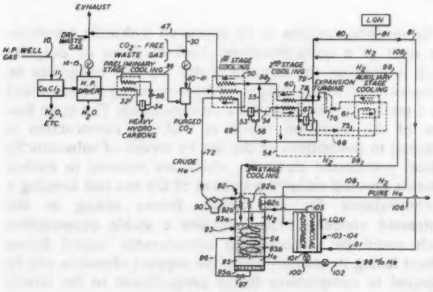


The invention relates to a drilling or production platform adapted to drill one or more submerged wells into an offshore substratum. The platform is self-buoyant to be floated to and from a drilling site, and comprises a work vessel adapted to be detachably connected to the ocean floor by an elongated, rigid mooring and drilling column. The latter is anchored to the ocean floor at a nonrigid connection whereby to permit limited pivotal movement of the column in response to displacing forces. The column houses a number of drill string or casing guides together with flow control means. The column upper end is adapted to detachably engage the vessel whereby to fixedly locate the latter above a subterranean drilling site.

3,653,220
PROCESS FOR HELIUM RECOVERY AND PURIFICATION

Kenneth M. Foster, Arlington, and Antony Lofredo, Springfield, both of N.J., assignors to Airco/Boc Cryogenic Plants Corporation, Murray Hill, N.J.

Filed May 9, 1969, Ser. No. 823,363
Int. Cl. F25j *3/00, 3/06*; F25t *3/00*
U.S. Cl. 62—22 12 Claims

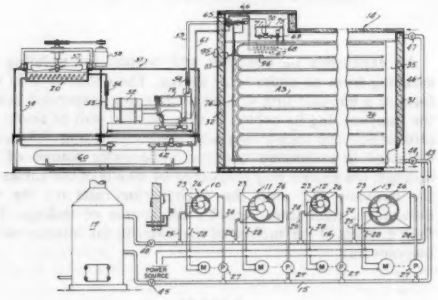


Process for recovering helium from natural gas having a well-head pressure in excess of 1,000 psig, comprising steps of: initially drying raw well gas by dry waste gas derived from the process, removing by adsorption in molecular sieves carbon dioxide (CO_2) from the gas, cooling the gas in sequential stages for liquefying the removing hydrocarbons and nitrogen, using cyclicly the resulting CO_2-free waste gas for the initial drying and for purging CO_2 from the molecular sieves respectively, compressing the remaining helium-rich gas to approximately 2,800 psig and cooling by liquid nitrogen for liquefying and removing the remaining nitrogen, and passing the concentrated helium through a cryogenic charcoal purifier for subsequent storage.

3,653,221
LATENT STORAGE AIR-CONDITIONING SYSTEM

Frank M. Angus, 6809 South Ridge Drive, Dallas, Tex.

Filed July 17, 1970, Ser. No. 55,686
Int. Cl. F25d *17/02*
U.S. Cl. 62—59 10 Claims



An air-conditioning system for structures with widely fluctuating loads includes a water storage and ice builder tank from which chilled water is circulated to the room cooling units located throughout the structure. Ice is produced in the storage tank through a direct expansion refrigeration system using freon R–12 as a refrigerant and including a compressor, a condenser, and evaporator coils located within the storage tank. Individually controlled evaporator coils are placed in serially connected chambers within the storage tank through which the water flows, and controls are provided for making the system completely automatic in operation.

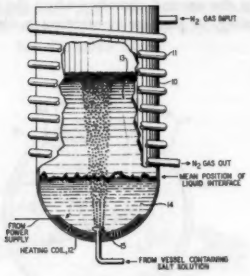
3,653,222
METHOD OF FREEZING SOLUTION DROPLETS AND THE LIKE USING IMMISCIBLE REFRIGERANTS OF DIFFERING DENSITIES

Eugene Blair Dunn, South Plainfield; Gerald James Massavage, Manville, both of N.J., and Harold Alfred Sauer, Hatboro, Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 27, 1970, Ser. No. 15,001
Int. Cl. F25c *1/00*; B29b *3/02*
U.S. Cl. 62—74 12 Claims

This disclosure describes a system for the continuous formation of frozen droplets of an aqueous salt solution. The refrigerant consists of two or more immiscible liquids of substantially different densities. Liquid droplets are injected into the lower, denser medium in a region maintained slightly above the liquid's freezing temperature. Heat is added to the lower medium and extracted from the upper medium at con-

trolled rates. The droplets rise through the negative temperature gradient thus created in the lower medium, and through



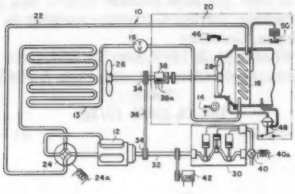
the turbulent interface between refrigerants. The frozen droplets are extracted from the surface of the upper medium.

3,653,223

AUTOMATIC OVERHEAT PROTECTION FOR REFRIGERATION SYSTEM

Daniel F. Jones; David J. Petranek, and Harlan J. Rosin, all of La Crosse, Wis., assignors to The Trane Company, La Crosse, Wis.

Filed Aug. 31, 1970, Ser. No. 68,256
Int. Cl. F25b *13/00*
U.S. Cl. 62—160 **7 Claims**



A schematic of an engine driven truck refrigeration system with control circuits is shown. The circuitry provides for automatic shutdown of the refrigeration system should the temperature of the conditioned space exceed a predetermined maximum overheat temperature to thereby prevent a malfunctioning refrigeration system from "cooking" the contents of the conditioned space. A lockout circuit prevents the shutdown circuit from functioning until the control point temperature has been reached or until a defrost mode is initiated so as to permit temperature pull down of the contents of the conditioned space from a temperature exceeding the predetermined maximum overheat temperature.

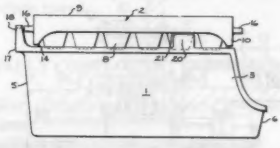
3,653,224

ICE SERVICE FOR HOUSEHOLD REFRIGERATORS

John Bor-Sow Tsen, Louisville, Ky., assignor to General Electric Company

Filed July 24, 1970, Ser. No. 58,118
Int. Cl. F25c *5/18*
U.S. Cl. 62—344 **4 Claims**

An ice service for an household refrigerator comprising an ice receptacle and a flexible freezing tray so designed that the tray can be stacked on the receptacle in its upright position and, in the inverted position, can be supported on the receptacle so that pressure on an unsupported corner of the tray will twist the tray for ejection of ice pieces therefrom. To this end the receptacle is provided with a section extending upwardly from the rear wall thereof and having a slot for receiving a handle on one end of the tray when the tray is in an inverted position above the receptacle and a projection



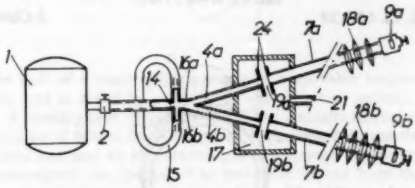
extending upwardly from a front portion of a receptacle sidewall for supporting a forward side portion of the inverted tray. This projection plus the anchoring of the handle in the slot supports the tray so that a downward pressure on an unsupported forward corner portion of the tray will twist the tray to release ice pieces therefrom.

3,653,225

GAS-COOLING SYSTEM AND ITS USES

Philippe Albert Hippolyte Marchal, Boulogne; Jacques Louis Paul Simonnet, Gifsur-Yvette, and Jean Prudent Fernand Rene Verrien, Paris, all of France, assignors to Bertin & Cie, Plaisir and Entreprise De Recherches Et D'Activites Petrolieres-Elf, Paris, France

Filed July 25, 1969, Ser. No. 845,018
Claims priority, application France, Aug. 5, 1968, 161906; June 6, 1969, 6918701
Int. Cl. F25b
U.S. Cl. 62—467 **14 Claims**



A gas-cooling system wherein a pressurized gas jet delivered by an injector across a break in continuity is collected in one or more tubes whose inlet aperture faces the injector and in which the collected gas is pulsated and heated by compressive wave phenomena to a temperature higher than that of the original jet, while impellent gas, removed at the level of the break in continuity via a suitable by-pass, is expanded in relation to the original jet and brought to a lower temperature than the latter.

ERRATUM

For Class 63—29 see:
Patent No. 3,653,227

3,653,226

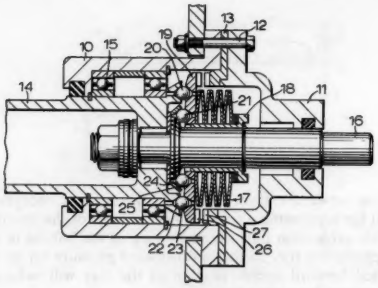
BI-DIRECTIONAL TORQUE LIMITERS

Roy Westbury, Bridgnorth, England, assignor to H. M. Hobson Limited, London, England

Claims priority, application France, Aug. 5, 1968, 161906; June 6, 1969, 6918701
Int. Cl. F16d *7/00*
U.S. Cl. 64—29 **2 Claims**

The combination, with a rotatable driving member and a cooperating rotatable driven member, of a bi-directional

torque limiter which operates to limit the torque which can be transmitted from the driving to the driven member irrespective of the direction of rotation of the driving member, said torque limiter comprising a spring loaded connection between the driving and driven members which includes an



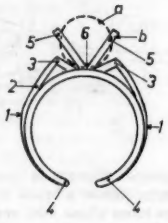
element which normally partakes in the transmission of the drive but which, when the output torque reaches a predetermined limit, is arranged to move against spring action into engagement with a fixed element to relieve the driven member from the input torque.

3,653,227

INTERCHANGEABLE SPHERICAL GEM SETTING AND A CORRESPONDING RING PROVIDED WITH SAID SETTING

Flavio Ricci, Via Trento 12, Sondrio, Italy

Filed July 7, 1969, Ser. No. 839,583
Claims priority, application Italy, Jan. 31, 1969, 18601 B/69
Int. Cl. A44c *17/02*
U.S. Cl. 63—29 **3 Claims**



This invention relates to an interchangeable spherical gem setting and a corresponding ring provided with said setting, which setting comprises two equal filiform circles of diameter less than that of the gem mutually inclined so as to form an angle such as to lock the gem contained between said two circles, which touch each other at the vertex of said angle, said circles being secured to the piece of jewellery in the proximity of said vertex, both the removability and retention of the gem being rendered possible by said juncture of the circles and by the elasticity of the material of which said circles are formed.

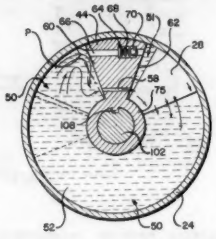
3,653,228

PROGRESSIVE CLUTCH

Giuseppe Tiberio, 2102 Kennedy Boulevard, Union City, N.J.

Filed Nov. 12, 1970, Ser. No. 88,866
Int. Cl. F16d *3/80*
U.S. Cl. 64—26 **11 Claims**

A coupling device for progressively, gradually and shocklessly coupling a rotary drive shaft and driven shaft, comprising a flat, cup-shaped impeller member with a disc shaped impelled member rotatably disposed therein. Jaws on the impeller member and impelled member are disposed in fluid filled first and second chambers inside the impeller member. A narrow bore in one jaw passes fluid from the first chamber to the second chamber when the impeller member starts rotating. A passage containing a check valve passes



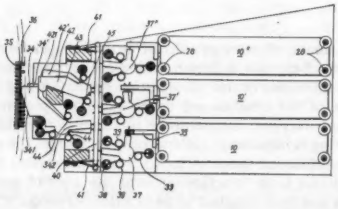
fluid in one direction from the second chamber to the first chamber when the impeller member stops rotating. A coil spring connected between the impelled and impeller members returns the jaws to initial angular position. A laterally weighted ring balances the jaws when rotating together. Two jaws can be provided on each of the impeller and impelled members for cooperative action.

3,653,229

PATTERN INSTALLATION FOR CIRCULAR KNITTING MACHINES

Herbert Gottsching, Berlin, Germany, assignor to Mayer & Cie, Tailfingen, Germany

Filed Sept. 2, 1969, Ser. No. 854,416
Claims priority, application Germany, Sept. 7, 1968, P 17 85 300.8
Int. Cl. D04b *15/78*
U.S. Cl. 66—50 R **11 Claims**



A pattern installation of circular knitting machines. The pattern installation enables needles carried by a rotary needle carrier to be electromagnetically selected for operation according to a given pattern. Control jacks supported for movement in the needle bed are moved by setting members which in turn are operatively connected with armatures of a plurality of reversible electromagnetic means. A plurality of these electromagnetic means are arranged in staggered relation for each yarn feeder of the circular knitting machine and each electromagnetic means includes at least one control coil, preferably supplied with an impulse, in order to bring about actuation of armature which is displaced in this way between a pair of predetermined end positions.

3,653,230

PROCESS FOR MANUFACTURING FRINGE HEADINGS PROVIDED WITH FRINGE TASSELS

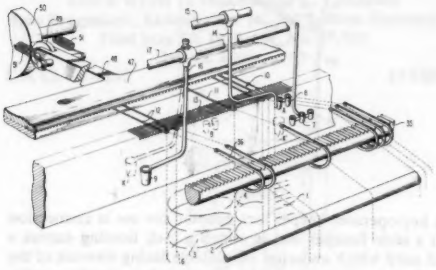
Renato Tosco, Via Cibrario 3, Chieri (Turin), Italy

Filed Dec. 4, 1968, Ser. No. 780,957

Claims priority, application Italy, Dec. 6, 1967, 54012; Feb. 5, 1968, 50408; Feb. 19, 1968, 50575

Int. Cl. D04b *23/14*

U.S. Cl. 66—85 **6 Claims**



A tasseled fringe is formed continuously in a warp-knitting or weaving machine, a continuous bundle of threads being linked with loops on a heading tape in a zigzag fashion, tied together close to the loops and subsequently trimmed remotely from the ties to form tassels on each loop.

3,653,231

MEANS AND METHOD OF CONTROLLING THE SPEED OF A CIRCULAR KNITTING MACHINE

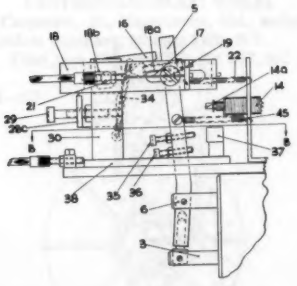
Dennis Gell, and Arthur William Spurling, both of Leicester, England, assignors to The Bently Engineering Company Limited

Filed Oct. 28, 1969, Ser. No. 871,866

Claims priority, application Great Britain, Nov. 9, 1968, 53,199/68

Int. Cl. D04b *9/00*

U.S. Cl. 66—56 **4 Claims**



A circular knitting machine is driven at any selected one of a plurality of speeds from a source of power through a variable-speed hydraulic driver of the known pump and motor type (preferably a Carter Gear) which is automatically adjusted to give the selected running speed by control apparatus actuated from the main pattern drum of the machine. The pump is driven at contact speed from the source of power and the control apparatus acts through a relay to vary the pump output and thereby to vary the speed of the motor, the motor being connected to the needle cylinder. The control apparatus comprises a mechanism having a speed control member spring biassed to move from a stop position to vary the pump output, and a limit device adjustable from the pattern drum to provide alternative limits to movement of the control member away from the stop position. The control member is latched in the stop position by a latch which is released by a start button, and provision is made for stopping the motor at the will of an operator and upon functioning of a stop motion, and for a high speed, a low speed, and at least one intermediate speed.

3,653,232

DIGITALLY CONTROLLED TRANSLATIONAL MOVEMENT

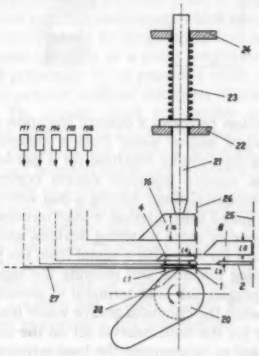
Arthur Walter, Denzlingen, Germany, assignor to Firma Erwin Sick

Filed Apr. 7, 1970, Ser. No. 31,045

Claims priority, application Germany, Apr. 8, 1969, P 19 17 835.9

Int. Cl. D04b *23/00*

U.S. Cl. 66—86 **2 Claims**



The bolt of a warp knitting machine is movable longitudinally and is urged by a spring in one direction against a stop. A rotating cam moves the bolt in the opposite direction. A plurality of blocks have an operative position between the cam and bolt and an inoperative position spaced therefrom. Electromagnets are employed to move the blocks from the inoperative to the operative position. The blocks have thicknesses that are digitally related to each other and each is a different digit.

3,653,233

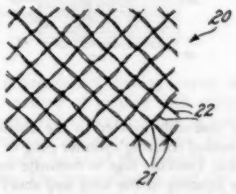
MACHINE KNITTING

Seymour C. Titone, Birchrunville, Pa., assignor to Titone Research & Development Corporation, Burlington, N.J.

Filed Dec. 5, 1968, Ser. No. 781,349

Int. Cl. D04b *21/20*

U.S. Cl. 66—177 **10 Claims**



Seamless hosiery, panty-hose, and the like are warp-knit, preferably of retractable or so-called "stretch" yarn, in a marquisette-like pattern and modifications thereof to provide

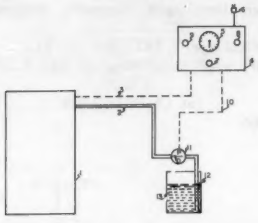
tubular garment fabrics characterized by sheerness of the leg portions thereof and by either sheer or opaque body portions.

3,653,234

CONTROL INJECTION SYSTEM FOR DRYCLEANING APPARATUS IN SYSTEMS

Robert A. Gillespie, Skaneateles, N.Y., assignor to Stauffer Chemical Company, New York, N.Y.

Filed Nov. 5, 1970, Ser. No. 87,138
Int. Cl. D06f *39/02, 43/00, 33/02*
U.S. Cl. 8—12 R **4 Claims**



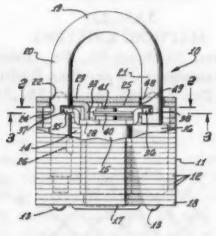
This invention provides a control injection system for adding a chemical and/or water from a metering device to a programmed drycleaning machine for a predetermined time interval. The control injection system comprises an automatic reset electrical timer having a dial which is setable for the predetermined time interval, a load terminal in communication with one or more metering devices, and receiving and relaying means for receiving a signal from the programmer of the drycleaning machine and relaying the signal to start the timer and energize the load terminal to actuate the metering devices to admit the chemical and/or water into the drycleaning machine for the time interval set on the timer. The timer being arranged to de-energize the load terminal at the end of the time interval independent of the length of the signal from the programmer.

3,653,235

PICK PROOF LOCKING PLATE FOR PADLOCK

William J. Fane, Burnaby, British Columbia, Canada, and Vernard W. Sanders, Los Angeles, Calif., assignors to Norris Industries, Inc., Los Angeles, Calif.

Filed Aug. 17, 1970, Ser. No. 64,514
Int. Cl. E05b *65/52, 63/00*
U.S. Cl. 70—38 A **7 Claims**



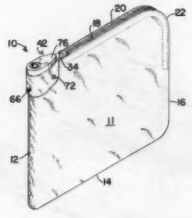
A cylinder assembly located in the chamber of a padlock has a key actuated rotating cylinder plug to which is attached a locking plate. Locking lugs at opposite ends of the locking plate engage notches in the long and short legs of a shackle to hold the shackle in locked position. Engagement of the lugs with the notches is such that when the lug engaging the short leg is clear, the lug engaging the long leg is still partly engaged. For that reason the shackle cannot be unlocked by unauthorized manipulation of a shim inserted through the clearance around the short leg of the shackle to release the locking lug from engagement with the short leg.

3,653,236

KEEPER LOCK FOR A SEPARABLE FASTENER FOR A MONEY BAG OR THE LIKE

William J. Kerr, Glenview, Ill., assignor to Chicago Lock Co., Chicago, Ill.

Filed Dec. 8, 1970, Ser. No. 96,007
Int. Cl. E05b *65/32*
U.S. Cl. 70—68 **8 Claims**



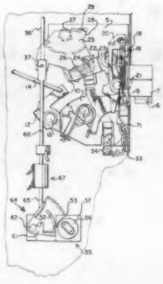
A key-operated keeper lock adapted for use in connection with a slide fastener and in which a lock housing carries a fixed anvil which underlies the slidable lacing element of the slide fastener, and a rotatable jaw member closely overlies said slidable lacing element in the locked condition of the lock. The jaw member is of the pop-up type, and when it is raised from a position of close proximity to the slidable lacing element, it may be swung to one side to expose the lacing element for manipulative purposes. An axial tumbler type lock assembly disposed alongside the jaw member operates through the medium of a detent ball to release the jaw member for pop-up purposes.

3,653,237

POWER LOCKING AND UNLOCKING APPARATUS FOR VEHICLE DOORS

Gideon A. DuRocher, Mt. Clemens, Mich., assignor to Essex International Inc., Fort Wayne, Ind.

Continuation-in-part of application Ser. No. 773,159, Nov. 4, 1968, now Patent No. 3,541,874, dated Nov. 24, 1970. This application Aug. 19, 1969, Ser. No. 851,343
Int. Cl. E05b *65/36*
U.S. Cl. 70—264 **17 Claims**



Power locking and unlocking apparatus for a vehicle's doors each having a latch and locking means movable from latch locking position to latch unlocking position and vice versa, the locking and unlocking apparatus comprising a reversible permanent magnet motor associated with each door and being operable in one direction or the other in response to the closing of a switch to lock or unlock the associated latch means. The power locking and unlocking apparatus associated with selected doors is operable to effect locking and unlocking of the latch means of all of the doors from inside the vehicle. The locking and unlocking apparatus associated with selected doors is operable by key controlled

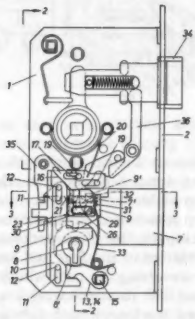
means and such key controlled means preferably has associated with it switch means operable from outside the vehicle to energize one or all of the locking and unlocking motors so as to permit one or all of the latch locking means to be operated by a selected one of the key controlled means. Time delay means preferably is associated with each of the locking and unlocking motors to provide a time interval between successive operations of any of the motors.

3,653,238

LOCK WITH TUMBLER-SAFETY-SLIDES

Hans Brugemann, Eichenstrasse 16, 562 Velbert, Germany

Filed May 15, 1970, Ser. No. 37,701
Int. Cl. E05b *21/00*
U.S. Cl. 70—252 **10 Claims**



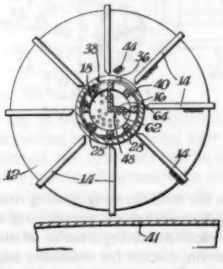
A lock with tumbler-safety-slides and a locking block equipped with entrance openings for the locking teeth of the slides, which comprises a locking block and a key having a plurality of bit steps. Safety-slides have locking teeth, and the locking block is displaceable in dependency upon a complementary bit step of the key crosswise to the locking teeth of the safety-slides.

3,653,239

CENTRIFUGAL BLAST WHEEL

James H. Carpenter, Jr., Hagerstown, Md., assignor to The Carborundum Company, Niagara Falls, N.Y.

Filed June 27, 1969, Ser. No. 837,262
Int. Cl. C21d *7/06*
U.S. Cl. 72—53 **15 Claims**



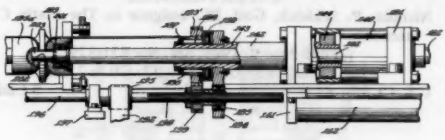
A centrifugal blast wheel for projecting peening balls comprises a runnerhead having a plurality of radial vanes mounted thereon and an impeller mounted in an impeller case in the central area of the runnerhead. Means are provided to prevent the peening balls from being trapped between the impeller blades and the slot in the impeller cage.

3,653,240

APPARATUS FOR MANUFACTURE OF TUBULAR PROJECTILES

Charles K. Huthsing, Jr., deceased, late of Libertyville, Ill. (by Evelyn N. Huthsing, executrix)

Filed Feb. 28, 1969, Ser. No. 803,337
Int. Cl. B21d *22/14*
U.S. Cl. 72—82 **7 Claims**



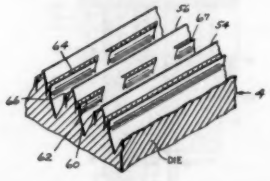
A plurality of tubular projectiles for use as fire extinguisher casings are simultaneously provided from a single piece of hollow cylindrical stock by techniques which involve rotating the cylindrical stock about its longitudinal axis and spinning the stock material inwardly at a point longitudinally central of each pair of projectiles to be provided while axially loading the stock to provide uniform thickness of material in the spinning area. The tubular stock is rotatably supported by formed mandrel apparatus in cooperation with a plurality of fluid operated actuators and material spinning is provided around the formed mandrel apparatus located within the hollow stock by a pair of rollers acting as another mandrel and having surfaces which conform to the formed surfaces of the interior mandrel apparatus, the rollers being movable over arcuate paths at the ends of a scissors apparatus which is also operated by a fluid controlled actuator. One end of a casing is closed by hot spinning or welding techniques and the formed end of a casing has a valve affixed thereto and the casing is charged to provide a fire extinguisher.

3,653,241

DIES FOR MAKING SELF-LOCKING SCREWS AND METHOD OF MAKING SAME

Roger W. Orlomoski, Paxton, Mass., assignor to Reed Rolled Thread Die Co., Holden, Mass.

Continuation-in-part of application Ser. No. 734,833, May 3, 1968, now Patent No. 3,517,717, dated June 30, 1970. This application Apr. 3, 1970, Ser. No. 26,520
Int. Cl. B21h *3/06*
U.S. Cl. 72—88 **24 Claims**



This invention relates to self-locking screws, thread rolling dies for and the method of making such screws. The self-locking result is achieved by forming one or more outwardly turned ribs, continuous or discontinuous, in the flank or flanks of one or more turns of the threads over a selected length of the screw. The screw threads and ribs therein may be made by the use of conventional thread rolling dies in which certain selected threads in one or both of the dies, over a suitable length have been deformed in a particular manner. The deformed die threads must be so located that the self-locking ribs formed in the threads of the screw will

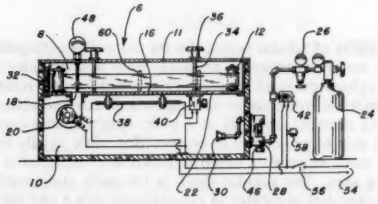
not be subsequently wiped out by encounter with the undeformed threads in the other die. Preferably, the ribs have the leading and trailing ends thereof faired back into the flank of the screw thread sufficiently to facilitate entry into and removal from the internal thread.

3,653,242

APPARATUS FOR TREATING A CONTINUOUS BODY UNDER PRESSURE

Nicholas P. Schleich, Golf, Ill., assignor to The Matix Corporation

Filed June 9, 1969, Ser. No. 831,329
Int. Cl. G03d *3/00*; **G01c** *9/12*; **G03b** *27/32*
U.S. Cl. 95—89 G **5 Claims**



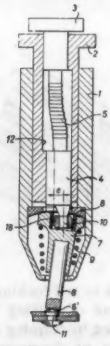
A method and apparatus for developing the latent image on a continuous flexible diazo web by subjecting the web to a heated pressurized atmosphere of ammonia in a sealed chamber.

3,653,243

DEVICE FOR FORMING CLOSING HEADS AT RIVETS

Paul Ramseier, Pfaffikon, Switzerland, assignor to Bracker AG, Pfaffikon, Switzerland

Filed Apr. 3, 1970, Ser. No. 25,514
Claims priority, application Switzerland, Apr. 11, 1969, 5502/69
Int. Cl. B21d *3/02*; **B21b** *3/06*
U.S. Cl. 72—122 **10 Claims**



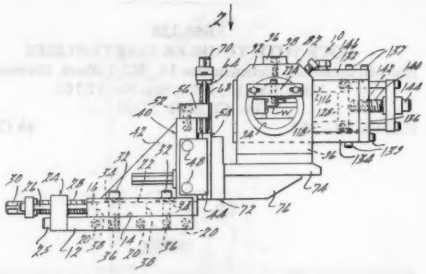
A device or apparatus for forming closing heads at rivets with the aid of a rivet set or anvil performing substantially loop-like revolving movements. According to the invention at least two drive members serve to drive the rivet set, the movements of which are superimposed and wherein at least one such movement can be adjusted.

3,653,244

BENDING AND TWISTING FIXTURE

Paul Tishken, Birmingham, Mich., assignor to Tishken Products Co., Detroit, Mich.

Filed Feb. 12, 1970, Ser. No. 10,811
Int. Cl. B21d *5/14*
U.S. Cl. 72—171 **7 Claims**



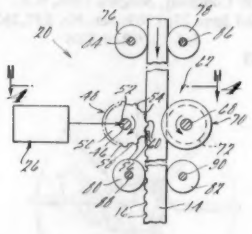
In combination in a strip workstock forming apparatus, first and second spaced rotatable workstock forming elements, a third rotatable workstock forming element disposed adjacent the first mentioned elements and defining therewith a first workstock path, the third workstock forming element being located relative to the first and second elements such that workstock traversing the path will be deformed in a first plane, fourth and fifth rotatable workstock forming elements defining a second workstock path substantially aligned with the first mentioned path but displaced therefrom a sufficient amount such that workstock traversing the second path from the first path will be deformed in a second plane different from the first plane.

3,653,245

APPARATUS FOR COLD ROLLING GRATING WORKSTOCK

Paul Tishken, Birmingham, Mich., assignor to Tishken Products Co., Detroit, Mich.

Filed Apr. 8, 1969, Ser. No. 814,292
Int. Cl. B21h *8/00*
U.S. Cl. 72—187 **18 Claims**



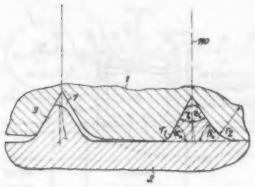
An apparatus for cold forming grating material from elongated, generally flat workstock, comprising a generally cylindrically shaped element having a series of outwardly directed projections thereon, means for rotatably supporting the element, guide means for guiding the workstock into peripheral engagement with the element whereby rotation thereof will cause the projections to be forced into the adjacent portion of the workstock to form a series of adjacently oriented, inwardly extending recesses or notched portions therein, and means including roller means for straightening and flattening the workstock after the series of notches are formed therein.

3,653,246

METHOD OF AND MEANS FOR ROLLING RODS

Ernst Bock, deceased, late of Peine, Germany (by Ingeborg Bock, administratrix); Martin Majewski, and Wilhelm Bartels, both of Peine, Germany, assignors to Ilseder Hutte, Peine am Hann., Germany, by said Majewski and said Bartels

Filed July 23, 1970, Ser. No. 57,620
Claims priority, application Germany, July 26, 1969, P 19 38 120.5
Int. Cl. B21h 8/02
U.S. Cl. 72—198 6 Claims



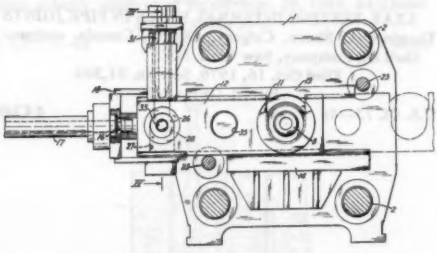
A metal rod to be used as a concrete armature is passed between a pair of counterrotating shaping rollers with complementary peripheral channels of substantially semicircular cross-section transversed by rib-forming grooves. The grooves merge with the channel surface along rounded edges, with the radius of curvature at the leading edge (as seen in the direction of roller rotation) smaller than that at the trailing edge; conversely, the angle included between the roller periphery and the front flank of each groove is larger than the desired leading angle of the rib whereas the angle included between the roller periphery and the rear flank of each groove is smaller than the desired trailing angle of the rib.

3,653,247

EXTRUSION PRESS

Helmut B. Huertigen, Pittsburgh, Pa., assignor to Sutton Engineering Company, Pittsburgh, Pa.

Filed Oct. 15, 1970, Ser. No. 80,893
Int. Cl. B21c 23/00; B21d 45/00
U.S. Cl. 72—263 5 Claims



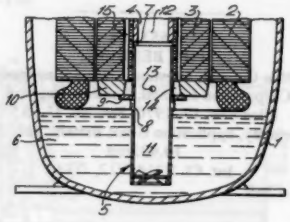
An extrusion die, in front of a container for a billet and a dummy block, is carried by a horizontal slide. After an extrusion has been formed, the container can be retracted to permit the extrusion to be cut off between the container and die. The slide is provided with a rearwardly opening recess spaced laterally from the die, and with a vertical passage intersecting the recess. The slide is movable horizontally in one direction after the container is retracted, to locate the recess in front of the container for receiving the dummy block and remains of the billet from the container. After the slide has been returned to its original position a vertical ram is moved down through the vertical passage to eject the dummy block from the bottom of the slide, and then a horizontal ram is moved rearwardly through the recess to eject the remains of the billet from the back of the slide.

3,653,248

LIQUID PUMP, PARTICULARLY AN OIL PUMP FOR REFRIGERATING MACHINES

Hans Ulrik Leffers, Augustenborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Feb. 2, 1970, Ser. No. 7,814
Claims priority, application Germany, Mar. 1, 1969, P 19 10 555.6
Int. Cl. B21d 43/28; B21k 3/04
U.S. Cl. 72—324 1 Claim



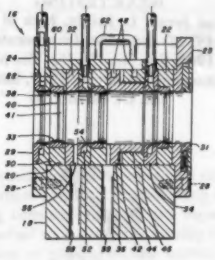
The invention relates to a method for making an oil pump for refrigeration machines. The pump comprises a tube formed by drawing which is press fitted into the bore of a motor rotor. The tube is initially formed with an inwardly domed, closed end portion. Circumferentially and radially extending incisions are made in the domed end portion to form cantilever portions which in turn are bent inwardly relative to the end of the tube to form blades.

3,653,249

DRAWN AND IRONED CONTAINERS

Lloyd G. Dunn, Lower Burrell, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Mar. 17, 1970, Ser. No. 20,268
Int. Cl. B21d 22/28
U.S. Cl. 72—349 8 Claims



A tool pack assembly for an ironing press for forming thin-walled container bodies including a die block having an open slot herein for receiving a plurality of ironing rings which are secured in the die block by means of an axially expandable hollow jack screw, with the die orifices in the rings in coaxial alignment with the press mandrel. Spacer rings are provided between the ironing rings and have means associated therewith for introducing lubricant around the entire periphery of the container body prior to movement of the body through successive ironing rings.

3,653,250

PROCESS FOR FORMING TITANIUM

James D. Collins, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 2, 1970, Ser. No. 25,247
Int. Cl. B21d *21/00, 1/06*
U.S. Cl. 72—364 5 Claims

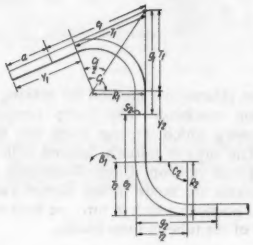
A process for forming titanium and titanium alloys comprising a two-step forming process of a partial form at subzero temperatures followed by a final form at room temperature or above.

3,653,251

PIPE BENDING

Paul Valentine Coonan, Preston, England, assignor to British Aircraft Corporation Limited, London, England

Filed Feb. 17, 1970, Ser. No. 11,993
Claims priority, application Great Britain, Feb. 28, 1969, 10,902/69
Int. Cl. B21d *7/12, 7/14*
U.S. Cl. 72—369 5 Claims



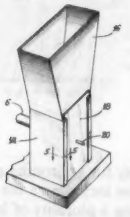
Producing replicas of a sample pipe using a numerically controlled pipe bending machine, by deriving a Programme for the machine from the sample pipe, modifying the Programme in accordance with measurement of a test bend of pipe material, and bending pipe material on the machine in accordance with the modified Programme.

3,653,252

WEAR TESTING

Paul J. Neff, and Jerald L. Bright, both of Chicago, Ill., assignors to AMSTED Industries Incorporated, Chicago, Ill.

Filed Aug. 21, 1968, Ser. No. 754,352. The portion of the term of the patent subsequent to Apr. 4, 1987, has been disclaimed.
Int. Cl. G01n *3/56*
U.S. Cl. 73—7 1 Claim



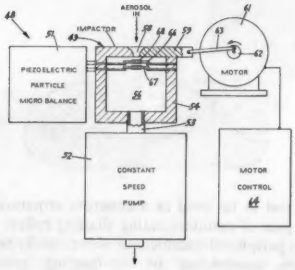
An elongated specimen bar of known weight is submerged in a mass of separate, irregular, abrasive lumps confined against rotation as a mass in a chamber, and then said bar is rotated on an axis angularly related to its longitudinal axis for a predetermined period of time. The bar is then removed from the chamber and is weighed to determine the amount of material which has been removed therefrom and/or the lumps are measured as by screening to determine the amount of crushing which has occurred in the lumps.

3,653,253

AEROSOL MASS CONCENTRATION SPECTROMETER

John G. Olin, Roseville, Minn., assignor to Thermo-Systems, Inc., St. Paul, Minn.

Filed Jan. 5, 1970, Ser. No. 1,068
Int. Cl. G01n *15/02*
U.S. Cl. 73—28 31 Claims



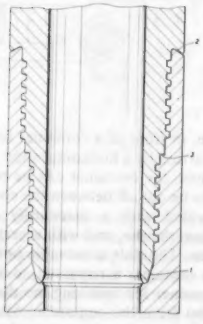
An apparatus and method for determining particle or aerosol mass concentration distribution using a particle sensing element, as a piezoelectric crystal, for collecting particles to increase the mass of the element. The particles are force deposited on the sensing element. The amount of force is sequentially changed to alter the critical particle size deposited on the sensing element. The mass of the particles accumulated on the sensing element during each force period provides information of the particle mass concentration. The difference between particle mass concentration, at two successive values of critical particle sizes, provides data relative to particle mass concentration distribution.

3,653,254

LEAK-TESTING INTERNAL SEALS IN PIPE JOINTS

Theodore A. Simon, Calgary, Alberta, Canada, assignor to Shell Oil Company, New York, N.Y.

Filed Oct. 16, 1970, Ser. No. 81,304
Int. Cl. G01m *3/08*
U.S. Cl. 73—46 4 Claims



The leak-testing of thread-connected, multiple-seal pipe joints is improved by connecting them to a limited extent that engages at least one internal seal without engaging the outer-

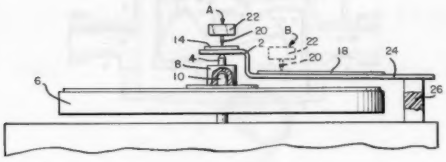
most seal, increasing the external fluid pressure to an amount significantly greater than the internal pressure, and detecting any resultant inflow of fluid.

3,653,255

RUMBLE TESTER FOR PHONOGRAPHS

Jacob Rabinow, Bethesda, Md., assignor to Max L. Libman, Reston, Va., a part interest

Filed Aug. 6, 1970, Ser. No. 61,765
Int. Cl. G01h *1/00*
U.S. Cl. 73—67 **5 Claims**



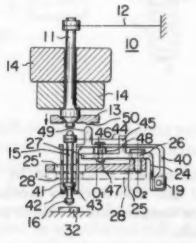
A rumble testing device for phonographs consists of a small adapter member to be placed over the center of a turntable. The adapter is provided with a vertical pin concentric with the spindle of the turntable. A sheet metal or plastic bracket rests on this pin so that it does not turn with the turntable. One end of the bracket rests on the pin while the other end rests on a block of soft, spongy material. Any vibration in the vertical or horizontal direction of the turntable is transmitted to this member. By placing the stylus of the cartridge of a photograph arm on the top surface of this strip member, either immediately above the pivot or close to it, the vibration of the turntable can be detected without the use of special "silent groove" test records and without the interference of the noise produced by such records being played.

3,653,256

HARDNESS MEASURING APPARATUS

Misao Mashimo, Yokohama, Japan, assignor to Kabushiki Kaisha Akashi Seisakusho, Tokyo, Japan

Filed Mar. 24, 1970, Ser. No. 22,276
Claims priority, application Japan, Mar. 29, 1969, 44/23600
Int. Cl. G01n *3/40*
U.S. Cl. 73—81 **12 Claims**



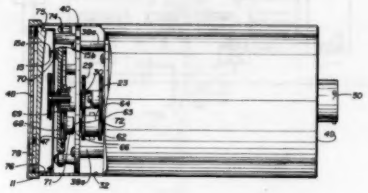
An apparatus for measuring hardness of a specimen comprises indenting means for forming an indentation in the upper surface of the specimen, loading means for applying a predetermined load onto said indenting means and an optical system for measuring said formed indentation which is a measure of the hardness of the tested specimen. The loading means is mechanically disconnected from the indenting means and adapted to be engaged with the latter, only when the load is applied thereto upon the measurement. By such arrangement, the rigidity, mass as well as bulk of the supporting structure for the indenting means can be considerably reduced, and hence a dynamical load due to such factors which may constitute a source of error in the measurement can be effectively eliminated.

3,653,257

DUAL TORQUE INDICATOR

Hanby S. Brindley, Arlington; John A. Buyers, Jr., Fort Worth; Turpin Gerard, Euless, and John S. McClung, Jr., Hurst, all of Tex., assignors to Textron-Inc., Fort Worth, Tex.

Filed Dec. 4, 1969, Ser. No. 882,260
Int. Cl. G01l *5/00*
U.S. Cl. 73—138 **8 Claims**



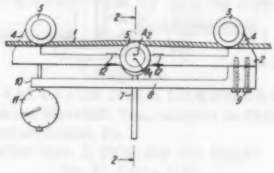
A meter for indicating two related functions together with the summation of the values of the two functions by means of a pair of coaxially, separately driven pointers cooperating with a scale on a fare plate behind the needles and a function summation unit driving a pointer behind the fare plate and extending at least in part in front of the fare plate in cooperation with a second scale thereon.

3,653,258

APPARATUS FOR MEASURING LOADS IN ROPES

Henry King, Langley, England, assignor to Fulmer Research Institute Limited, Stoke Poges, Buckinghamshire, England

Continuation of application Ser. No. 741,472, July 1, 1968, now abandoned. This application Nov. 4, 1970, Ser. No. 86,992
Claims priority, application Great Britain, July 13, 1967, 32,398/67
Int. Cl. G01l *5/04*
U.S. Cl. 73—144 **16 Claims**



Apparatus for measuring the loading of a rope comprising three rope engagement members spaced along a resilient support for engaging opposite sides of the rope, one of said members being carried on a carrier and being displaceable by eccentric pivotation or sliding on the carrier, upon movement of an adjustment member, to deflect the rope, means being provided for measuring distortion of the resilient support in response to the rope deflection.

3,653,259

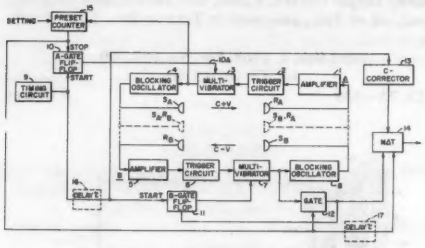
ULTRASONIC FLOWMETER SYSTEMS

James L. McShane, Churchill, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 6, 1970, Ser. No. 17,196
Int. Cl. G01f *1/00*
U.S. Cl. 73—194 A **6 Claims**

Described are systems for measuring the rate of fluid flow wherein the time delay between acoustic pulses transmitted

upstream and downstream in a fluid passing along a path of travel is multiplied by repeated transmissions in sing-around fashion. The systems of the invention have the advantage of fast response time, but do not require the measurement of very small time differences, particularly at low velocities, because of the cumulative effect of combing the time delays between upstream and downstream pulses over a period of time.



3,653,260

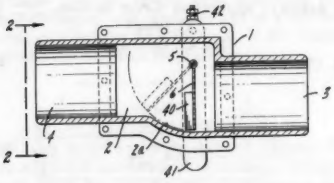
FLOW INDICATOR

Grant V. W. Roth, 1440 Sheridan Road, Wilmette, Ill., and Charles E. Krupp, Hemmed-In Hollow North Old Rand Road, Wauconda, Ill.

Filed Dec. 23, 1968, Ser. No. 786,223

Int. Cl. G01f *1/00*

U.S. Cl. 73—228 **3 Claims**



A flow indicator having an element responsive to liquid flow and a bypass channel for gas flow, the bypass channel being offset from the liquid-responsive member in a direction taken by gases through the device whereby the flow-responsive member is responsive to liquid flow and not to gas or gas-liquid flow. A cooperating external signal transmitting element is mounted for variable positioning on the device.

3,653,261

PRESSURE DEMAND METER FOR FLUID FLOW MEASUREMENT

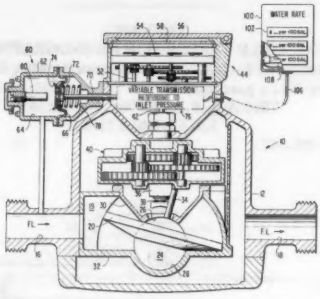
Stephen L. Feldman, Baltimore, Md., assignor to Richard Ruben, Arlington, Va., a part interest

Filed Mar. 6, 1970, Ser. No. 17,073

Int. Cl. G01f *1/02*

U.S. Cl. 73—233 **16 Claims**

The meter includes a quantity meter, pressure measuring device and a register. The outputs of the pressure measuring device and quantity meter are correlated to provide a numerical readout at the register inversely proportional to the pressure of the fluid in the fluid line and directly proportional to the quantity of flow whereby demand on the fluid system is reflected in the quantity readout.



3,653,262

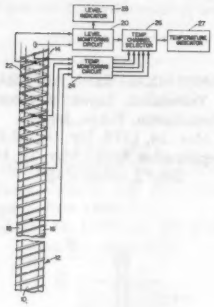
TEMPERATURE AND LEVEL SENSOR

Albert D. Ehrenfried, Concord; John Niejadlik, Littleton, and Norton T. Pierce, Concord, all of Mass., assignors to Metritake, Inc., West Concord, Mass.

Filed Oct. 22, 1970, Ser. No. 82,875

Int. Cl. G01f *23/24;* **G01k** *7/16, 13/02*

U.S. Cl. 73—292 **9 Claims**



An elongated sensor adapted to be suspended within a fluent material and operative to measure the level of the material and the temperature at one or more positions within the material bulk.

3,653,263

INFRARED TEMPERATURE SENSOR AND CONTROL FOR USE WITH HEATED, MOVING BODIES

Richard R. Poole, and David D. Bulkley, both of Norwalk, Conn., assignors to Irtronics, Inc., Stamford, Conn.

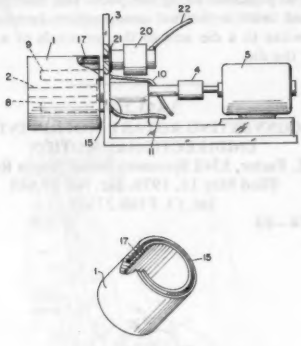
Filed July 15, 1969, Ser. No. 841,861

Int. Cl. G01j *5/62;* **G01k** *13/08*

U.S. Cl. 73—351 **13 Claims**

A temperature sensor is provided for measuring infrared radiation from a heated, moving processing device. The measurement is made from a "black body" cavity extending within the device being measured and so provides greater ac-

curacy of readings. If the device being measured is cylindrical and rotates, the cavity is along the edge of the rotational surface and may be subdivided so as to provide a chopper for



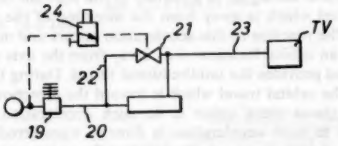
the readings. Control circuitry associated with the infrared detector allows the sensor to control heating elements within the device.

3,653,264

APPARATUS FOR DETECTING A LEAK IN A FLUID PRESSURE SYSTEM

Albert E. Mills, 10 Cloisters Road, Letchworth, England

Filed Nov. 25, 1969, Ser. No. 879,789
Claims priority, application Great Britain, Nov. 25, 1968, 56,146/68
Int. Cl. G01l 9/04
U.S. Cl. 73—398 R **9 Claims**



A fluid-pressure differential cell wherein pressure is transmitted between the two sides of the cell internally thereof by means of a liquid medium.

The liquid may be contained between spaced apart diaphragms so that pressure applied to one diaphragm is transmitted to the other. In a preferred cell of the present invention, providing an amplification of the signal produced by the pressure difference, the two diaphragms are bellows diaphragms, one of a greater cross-sectional area than the other, between which liquid passes on the development of a pressure difference between the two sides of the cell, so that the amplified signal is constituted by an expansion of the bellows diaphragm of narrower cross-section, over a greater axial distance than the other bellows diaphragm is contracted by that pressure difference.

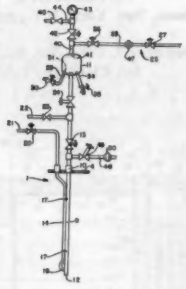
The bellows diaphragms may be separated by a chamber connecting the internal spaces of the two diaphragms, and the chamber may be formed with an access port for filling the chamber and the internal spaces of the bellows diaphragms with the liquid which, preferably, is a light oil.

3,653,265

CATALYST SAMPLING APPARATUS

Barney Vallino, Homewood, and Thomas G. Merchant, Chicago, both of Ill., assignors to Atlantic Richfield Company

Filed Sept. 11, 1970, Ser. No. 71,438
Int. Cl. G01n 1/10
U.S. Cl. 73—421 B **8 Claims**



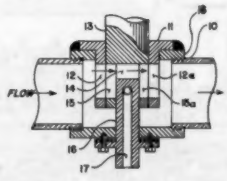
An apparatus for a method of withdrawing samples of particulate solids, e.g., catalysts, from a bed of particulate solid material located in a vessel under super-atmospheric pressure. Differential pressure between the vessel and a solids receiver carries the sample from a bed of the solids in the vessel through a tubular sampler and into the receiver where the sample is purged and cooled, after which it it transferred to a container for storage until examination or analysis. An elongated tubular purging means communicating with the tubular sampler is used to inject a gas, e.g., nitrogen, into the tubular sampler. This action serves to regulate the amount of material withdrawn from the bed. It also serves to purge the tubular sampler of fluid and solid material and the receiver of vapors after sampling is completed. The apparatus is especially adapted for installation into existing commercial reaction vessels and allows catalyst sampling to be effected while a reaction vessel is in operation. Recycle gas, hydrogen gas or an inert gas can be introduced into the tubular sampler to minimize coking therein while the sampling apparatus is not in operation.

3,653,266

DISPENSER VALVE FOR THICK LIQUIDS OR SLURRIES

Robert E. Holmes, Marshall, Tex., assignor to Thiokol Chemical Corporation, Bristol, Pa.

Filed Mar. 5, 1970, Ser. No. 16,831
Int. Cl. G01n 1/10
U.S. Cl. 73—422 TC **5 Claims**



A valve is presented which is capable of metering and dispensing a quantity of a thick liquid or slurry on a rapid production basis. The valve allows the slurry to move through it freely except for momentary interruption during the actual metering and dispensing cycle and thus the heavier or more solid components of the slurry do not tend to settle

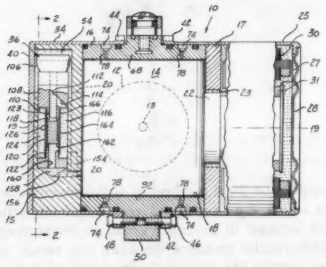
out nor collect in the valve as readily as they would otherwise. Also, the valve is simple to construct and maintain having but one moving part in the slurry which first rotates to close the valve to enclose an exact metered portion of the slurry and then translates to dispense it.

3,653,267

IN A HYDROSTATICALLY SUPPORTED GYROSCOPE A FLEXIBLE TUBE PUMP PROVIDING FLUID CIRCULATION TO HYDROSTATIC BEARINGS OF THE GYROSCOPE

Oscar D. Jacobson, New York, N.Y., assignor to The Bendix Corporation

Filed May 7, 1969, Ser. No. 822,524
Int. Cl. G01c *19/20*
U.S. Cl. 74—5 **12 Claims**



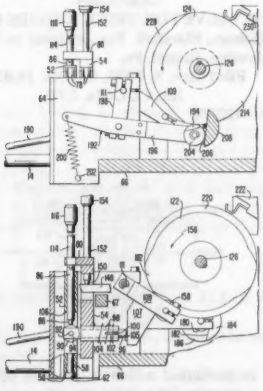
A combination in a hydrostatically supported gyroscope of a flexible tube pump of a Bourdon tube type in an assembly including a motor means or electrically controlled solenoid to actuate the flexible tube in an arrangement in which the tube functions as a low power input pump which may be utilized to supply a liquid pressure medium to hydrostatically support bearings of the gyroscope.

3,653,268

TOOL MOVING MECHANISM

John C. Diepeveen, 1737 Kimberly Drive, Sunnyvale, Calif.

Filed Mar. 10, 1970, Ser. No. 18,153
Int. Cl. F16h *25/08*
U.S. Cl. 74—55 **20 Claims**



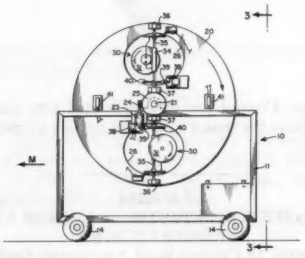
Apparatus for moving a tool along a predetermined path and in accordance with a preselected sequence wherein the apparatus includes a slide unit shiftably mounted for movement along a generally vertical path, the slide unit having a pair of relatively shiftable members which are normally releasably interconnected. One of the members of the slide unit is adapted to be coupled to a tool and is released from coupled relationship to the other member when the slide unit is at several positions along the path. The invention is suitable for use with a thermal compression bonding tool for bonding wires to a die and to the terminals of a supporting frame for the die.

3,653,269

CONVERTING ROTARY MOTION INTO UNIDIRECTIONAL MOTION

Richard E. Foster, 5342 Sycamore Street, Baton Rouge, La.

Filed May 15, 1970, Ser. No. 37,661
Int. Cl. F16h *27/00*
U.S. Cl. 74—84 **10 Claims**



Unidirectional thrust and consequent unidirectional motion are achieved by rotating thrust producing units in a circular orbit. The thrust producing units involve weights or masses which are caused to accelerate in the direction of the orbital travel during all or a portion of the one-half of the orbital travel which is away from the direction of the desired thrust. The reaction to this acceleration occurs and manifests itself at an orbital location—i.e., away from the axis of rotation—and provides the unidirectional thrust. During the one-half of the orbital travel which is toward the direction of the desired thrust there either is no such acceleration or the reaction to such acceleration is directly transferred to the axis of rotation, and consequently in either case no reaction is manifested at an orbital location. Hence, there is no thrust in the direction opposite that desired.

3,653,270

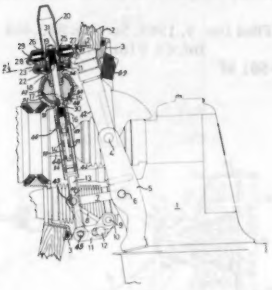
TILTING AND TRIMMING ARRANGEMENT FOR A TILTABLE OUTBOARD PROPELLER HOUSING FOR A BOAT

Karl Abdon Bergstedt, Goteborg, Sweden, assignor to AB Volvo Penta, Gothenburg, Sweden

Filed July 7, 1970, Ser. No. 52,951
Int. Cl. B63h *1/14, 5/06*
U.S. Cl. 74—89.15 **23 Claims**

An electro-mechanical trimming and tilting arrangement for an outboard propeller housing for a boat in which a linkage system couples a jack screw mechanism operated by a reversible electric motor to the tiltable propeller housing. The jack screw mechanism is self-aligning by being mounted by a ball and socket and includes a worm drive between the motor and a rotatable nut which screws a threaded rod up and down through the nut. The nut is caged in operative position by spring loaded detents which yield to release the nut and thereby permit the propeller housing to kick up upon

meeting an obstruction. Yieldable flaps are swingable into position to restrain the detents during reverse operation of the propeller to prevent kick-up when backing down. The rod is provided with threads of differing pitch according to the first embodiment, or the nut and rod are provided with a recirculating ball screw connection according to a modification, whereby trim adjustments to the outboard housing are



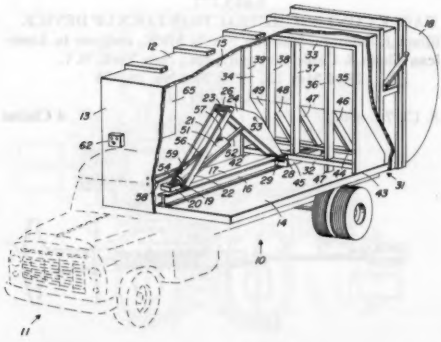
accomplished slowly and tilting movement is accomplished rapidly. The worm connection acts to prevent rotation of the nut by the forces imposed by the propeller reaction whereby the mechanism retains the housing in the position into which it is adjusted by operating the motor. A dog clutch or cone clutch connects the nut to a worm wheel to disconnect the nut from the motor when the nut escapes from the detents.

3,653,271

ACTUATING MECHANISM FOR REFUSE CONTAINER

Stanley W. Worthington, First and Iowa Streets, Cedar Falls, Iowa

Filed June 29, 1970, Ser. No. 50,411
Int. Cl. F16h *21/44*
U.S. Cl. 74—101 **1 Claim**



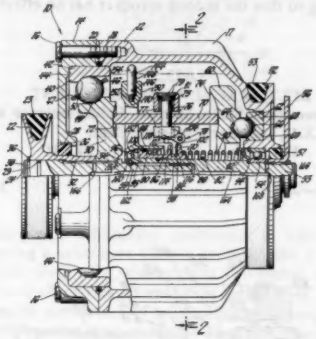
This invention relates to an actuator for a compacting blade for a refuse body. Novel scissors types of linkage mechanism are driven by a double acting cylinder to amplify the stroke so that there is a working stroke greater than the piston travel of the actuating cylinder.

3,653,272

ACCESSORY DRIVE MECHANISM

Milton H. Schelter, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 17, 1970, Ser. No. 64,292
Int. Cl. F16h *15/04, 15/38*
U.S. Cl. 74—190.5 **9 Claims**



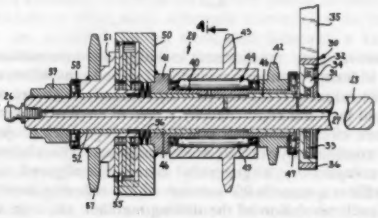
An accessory drive mechanism having a continuously variable output/input speed ratio including a housing containing a predetermined volume of fluid, input means, output means, a drive pulley operatively connected to the input means, an input race member having a toroidal surface formed thereon and mounted for rotation with the input means, an output race member having a toroidal surface formed thereon oppositely disposed from the first-mentioned toroidal surface, a plurality of rollers frictionally engaging the oppositely disposed toroidal surfaces, drive means formed on the output means for driving engine accessories, and an "internal sensing" ratio control means including a nonrotating pitot tube means for sensing changes in fluid force reflecting changes in input speed and including a piston-actuating mechanism for inclining the rollers, effectuating roller tilt along the toroidal surfaces to change the output/input speed ratio in response to the changes in fluid force communicated thereto by the pivot tube means.

3,653,273

TWO-SPEED TRANSMISSION

Robert V. Albertson, Wayzata, and Victor N. Albertson, Minneapolis, both of Minn., assignors to Minnesota Automotive, Inc., Mankato, Minn.

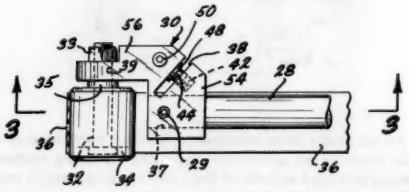
Filed Nov. 4, 1970, Ser. No. 86,651
Int. Cl. F16h *11/04;* **F16d** *67/00*
U.S. Cl. 74—217 B **9 Claims**



Disclosed is a first sprocket adapted to operate as a driving sprocket for the rear wheel of a motor bicycle or the like and

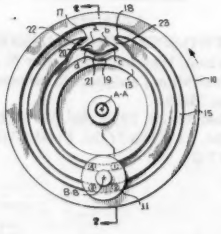
a second sprocket adapted to be driven through a chain by a motor, which second sprocket is connected through an over running clutch to a shaft mounting the first sprocket. A third sprocket is mounted on the shaft for rotation relative to the shaft and engageable with the shaft through a manually operable disc clutch. The speed of driving the second and third sprockets is such that whenever the third sprocket is driven, by engaging the manually engageable clutch, the shaft turns at a speed to cause the over running clutch to operate as a bearing so that the second sprocket has no effect on the shaft.

3,653,274
BELT TRACKING ARRANGEMENT
Sidney Greenwood, Santa Monica, Calif., assignor to Nitto Kohki U.S.A., Inc., Santa Monica, Calif.
Filed July 1, 1970, Ser. No. 51,546
Int. Cl. F16h *7/18*
U.S. Cl. 74—241 **7 Claims**



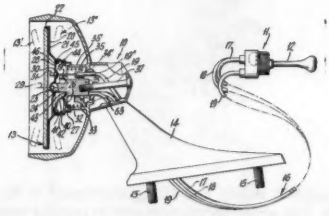
A belt operated tool having a bracket for mounting the front idle pulley around which the belt travels. The bracket is L-shaped, having two legs, and the position of the legs can be adjusted with respect to each other by a bolt, to reposition the idle pulley and change the belt tracking.

3,653,275
GENEVA GEAR MECHANISM
Ronald Leacock, 4719 Frelder St., Tampa, Fla.
Filed Dec. 22, 1970, Ser. No. 100,715
Int. Cl. F16h *55/04*
U.S. Cl. 74—436 **10 Claims**



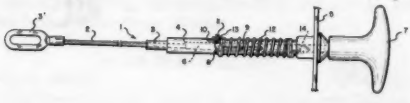
A geneva gear mechanism includes an intermittently rotated indexing member having four tapered pins which are spaced at respective corners of a square and which are axially urged into and captivated by a pair of similarly tapered concentric circular channels in a locking ring which projects from a continuously rotated driving member. The channels are interrupted by a generally diamond-configured cam which effects a smooth 90° rotation of the indexing member during each revolution of the driving member, the cam and locking ring defining transition paths for the pins during rotation of the indexing member. The cam and transition paths are configured to effect uniform rotation of the driven member and to captivate at least two pins during indexing member rotation. Transition path configuration is determined with the aid of large and small gear wheels, the latter having four holes spaced identically to the tapered pin spacing. Rotation of the small gear by 90° about the periphery of the large gear causes the four holes to describe the requisite transition paths.

3,653,276
REMOTE-CONTROL MIRROR SYSTEM
Matthew McIntyre, and Harry Edwin Goodfellow, both of Jackson, Tenn., assignors to Jervis Corporation, Bolivar, Tenn.
Filed Dec. 9, 1969, Ser. No. 883,488
Int. Cl. F16c *1/12*
U.S. Cl. 74—501 M **17 Claims**



The invention contemplates a remote-control mirror system in which a completely assembled mirror unit and control unit, with interconnecting flexible control-cable means, is preloaded at the factory so that later installation of the system in a vehicle requires no adjustment to assure perfect control action. In the form described, the universal pivot action at both the control and mirror ends of the system utilizes truncated spherical bearing surfaces which establish fixed-center pivotal support at both ends. The pivots are of the non-captive variety, and factory preloading assures seating contact at both end pivots of the system, before and after assembly to the vehicle.

3,653,277
CABLE CONTROL RETRACTION-LOCKUP DEVICE
William J. Gilmore, Manitou Beach, Mich., assignor to American Chain & Cable Company, Inc., New York, N.Y.
Filed May 13, 1970, Ser. No. 36,796
Int. Cl. F16c *1/10*
U.S. Cl. 74—502 **4 Claims**

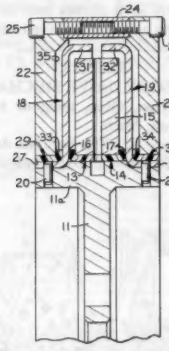


A retraction-lockup device for a push-pull cable including a housing for supporting one end of the cable, and a spring connected between the cable and the housing for urging the cable into a normally retracted position locked against longitudinal movement.

3,653,278
TORSIONAL VIBRATION DAMPER HAVING INDEPENDENT WEIGHTS

Dale C. Brinkman, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 23, 1970, Ser. No. 101,020
Int. Cl. F16f 15/12
U.S. Cl. 74—574 14 Claims

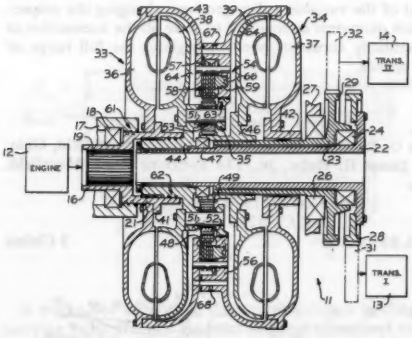


A torsional vibration damper comprises a hub adapted to be attached to the crankshaft of an internal combustion engine. Inner and outer weights are rotatably mounted on the hub with the inner weight being mounted within a closed annular chamber formed by the outer weight. A shear inducing disc, attached to the hub, is positioned on each side of the inner weight in the chamber. The chamber is filled with a highly viscous fluid, such as silicone, for tuning and damping purposes.

3,653,279
DIFFERENTIAL FLUID COUPLING DRIVE

James R. Sebern, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 23, 1970, Ser. No. 91,976
Int. Cl. F16h 1/44, 47/06
U.S. Cl. 74—710.5 7 Claims

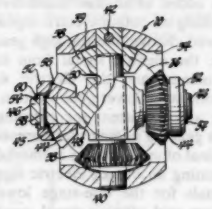


A differential fluid coupling drive wherein a pair of fluid couplings in conjunction with an intermediate planetary type differential and lock-up clutch are employed to deliver power from a single engine to two separate dual power shift transmissions respectively driving opposite side wheels of a vehicle. The drive allows a normal differential action at small differences in wheel speeds, as in turning, but has high resistance to large wheel speed differentials, such as when one wheel loses traction.

3,653,280
FOUR-PINION DIFFERENTIAL

Robert B. Koskela, Pontiac, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 5, 1970, Ser. No. 61,147
Int. Cl. F16h 1/40
U.S. Cl. 74—713 3 Claims

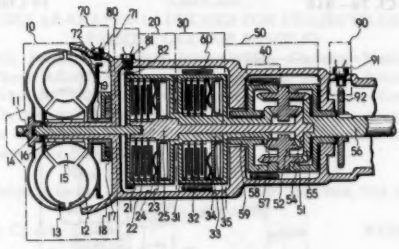


A four-pinion differential mechanism in which a cross-shaft having a cross-bore therein encircles and is carried by the pinion shaft of a conventional two-pinion differential. The cross-shaft carries an additional two pinions. This structure permits conversion of a conventional open-faced two-pinion differential into a higher capacity four-pinion differential.

3,653,281
AUTOMATIC TRANSMISSION WITH KICKDOWN MECHANISM

Takeaki Shirai, Nagoya-shi; Shigeru Sakakibara, Chita-gun; Masaaki Noguchi, Nagoya-shi, and Masaharu Sumiyoshi, Toyota-shi, all of Japan, assignors to Nippon Denso Kabushiki Kaisha and Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi-ken, Japan

Filed Jan. 26, 1970, Ser. No. 5,460
Claims priority, application Japan, Jan. 29, 1969, 44/6416
Int. Cl. F16h 47/00, 5/42; B60k 21/00
U.S. Cl. 74—731 9 Claims



An automatic transmission wherein means for effectuating a kickdown effect in an automatic transmission for the vehicle are provided, having associated therewith a kickdown mechanism, wherein the transmission is provided with hydraulic torque converter means having a hydraulic torque converter pump connected to the engine output shaft, and a hydraulic torque converter turbine connected to the input shaft of transmission, friction engaging means for determining the desired operative gearing for said transmission; an oil pressure operation circuit for controlling said friction engaging means and having a manual speed change value determining valve and a distribution valve for distributing the operation oil into said friction engaging means; a signal generator means for generating electric signals based on the slip ratio and vehicle speed; a gear position determining signal generator for generating a gear position electric signal by detecting the gearing state of said transmission; a synchronous time retaining means for maintaining generating

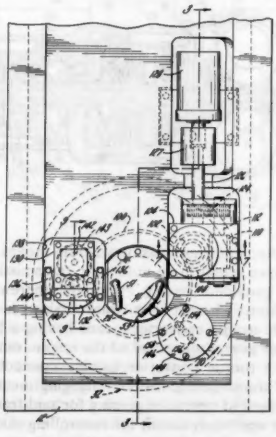
output electric signals in time relationship upon the operation of said distribution valve; a bistable memorial circuit for establishing the conductivity or non-conductivity of the means for the operation or non-operation of said distribution valve by erasing the output electric signal when an input electric signal is added to one input terminal and by maintaining the generating output electric signal when an input electric signal is added to another input terminal; an AND-circuit for generating an output electric signal when the electric signal for speed change into the high gear state from said signal generator, the electric signal from said synchronous time retaining means, and the electric signal for speed change into the one stage lower gear position signal from said signal generator are coexistent for carrying out the speed change into high gear by adding the aforesaid electric signal to said one terminal of said bistable memorial circuit; an OR-circuit for generating an output electric signal when one of the electric signals for the one-stage lower gear position speed change from said running signal generator is present; an AND-circuit for carrying out the speed change into the one-stage lower gear position by adding an electric signal to said other terminal of said bistable memorial circuit by generating the output electric signal when the electric signal from said OR-circuit, the electric signal from the high gear position signal and the electric signal from the synchronous time retaining circuit are coexistent; and means for operating said bistable memorial circuit and said distribution valve; and AND-circuit between said means and said bistable memorial circuit; and providing a kickdown signal generator for delivering kickdown signal to said AND-circuit through NOT-means; whereby the said distribution valve is brought into non-operable state when the signal from said NOT-means among the signals from NOT-means and said bistable memorial circuit is eliminated, thereby effectuating a kickdown as aforesaid.

3,653,282

POWER TOOL TURRET ASSEMBLY

Russell D. Bouffiou, McFarland, and Christian A. Nielsen, Madison, both of Wis., assignors to Giddings & Lewis, Inc., Fond du Lac, Wis.

Filed Oct. 13, 1969, Ser. No. 865,630
Int. Cl. B23b *29/32*
U.S. Cl. 74—815 **16 Claims**



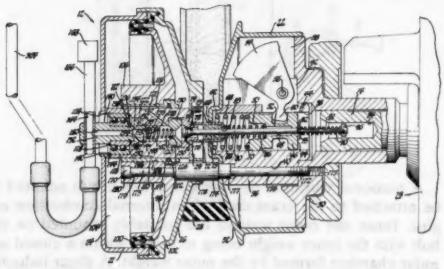
A machine tool turret head, more particularly a power operated turret head, is provided with fluid power actuated toggle means for axially clamping the turret head to the machine tool ram or saddle. When a wedge member is withdrawn from a position between the toggle members, the turret head is released from a clamped work position and allowed to slide axially for a limited distance along a turret head stem. Logic circuitry and a resolver are employed to cause a motor and drive train to rotate the turret head and to locate the head via the most expeditious route within the predetermined initial angular tolerance limits of a new work position. The wedge member is then reinserted between the toggle means to move the turret axially back along the stem, and reclamp the turret in its new work position. A lost motion coupler is included in the drive train to allow the turret head to rotate slightly as it moves into its clamped position without damage to the associated drive train or other parts.

3,653,283

ACCESSORY DRIVE MECHANISM

David W. Betz, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed June 8, 1970, Ser. No. 44,155
Int. Cl. B60k *21/10;* **F16h** *9/18*
U.S. Cl. 74—864 **5 Claims**



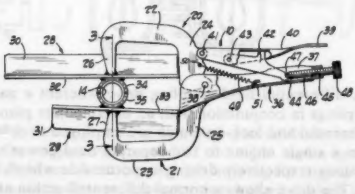
An engine accessory drive mechanism wherein a first pulley portion is driven by the crankshaft and a second pulley portion is mounted on the water pump shaft and driven by a belt interconnecting the two pulleys. The second pulley portion includes provisions formed thereon for mounting additional belts to drive the other engine accessories. Each pulley portion includes one wall which is movable in response to changes in engine vacuum, with the influence of the engine vacuum on the movable walls being modified by the action of centrifugal force, the flyweight mechanism therefor being mounted on the first pulley portion, and the overall result being that the interconnecting belt is moved alternately in and out of the variable pulley grooves, changing the respective pitch diameters as required to drive all the accessories at a substantially constant speed throughout the full range of engine speeds.

3,653,284

PLASTIC PIPE GRIPPING TOOL

George O. Pynchon, 54 Northfield Avenue, Northfield, Ohio, and James H. Hulse, Jr., 116 Elmridge Road, Mansfield, Ohio

Filed Oct. 27, 1970, Ser. No. 84,317
Int. Cl. B25b *7/02, 27/00*
U.S. Cl. 81—5.1 R **3 Claims**



The invention relates to a vice-grip plier having rest surfaces adapted to maintain the pliar in a horizontal plane on

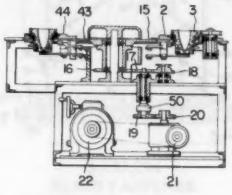
the top end of a well casing while holding a plastic pipe, being inserted into the casing, in a vertical plane centered in the casing.

3,653,285

APPARATUS FOR TRIMMING OPENING RIMS OF SYNTHETIC-RESIN CONTAINERS

Shinsuke Yoshikawa, and Yuji Sawa, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed July 10, 1970, Ser. No. 53,732
Int. Cl. B23b *3/04, 7/00, 5/14*
U.S. Cl. 82—101 **2 Claims**



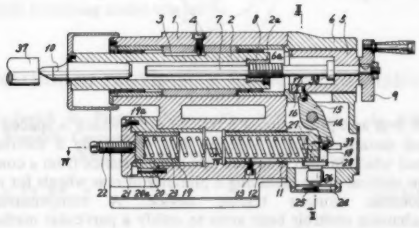
Several trimming devices are mounted in a circle on a turn-table and thereby undergo orbital revolution, each trimming device comprising a rotary holder for holding a synthetic-resin container having a neck, a clamping device for firmly holding the neck, and a cutting-tool device for feeding a knife to the container in rotating state to trim off surplus material from the opening rim, and coordinating mechanisms are provided so that, during one revolution of the turn-table, each of the trimming devices successively carries out one cycle of the operational steps of receiving a container, trimming the rim thereof, and discharging the same.

3,653,286

WORKPIECE SUPPORTING DEVICE

Takahito Okada, Aichi, Japan, assignor to Toyoda Koki Kabushiki Kaisha, Aichi-ken, Japan

Filed Oct. 23, 1970, Ser. No. 83,308
Claims priority, application Japan, Oct. 24, 1969, 44/101562
Int. Cl. B23b *23/00*
U.S. Cl. 82—31 **4 Claims**



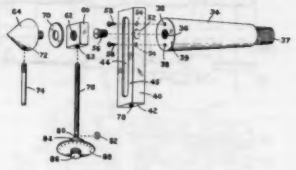
A workpiece supporting device comprises a holding shaft carrying at its one end a center adapted to support one end of a workpiece. A holding force is applied against the workpiece by a spring interposed between first and second coaxial sleeves, the first sleeve being operably connected to the other end of the holding shaft through a swing arm. The holding force applied on the workpiece may be varied by adjusting the spring force, which is effected by moving the second sleeve axially. A pointer and a dial scale are connected to the first and second sleeves by rack and pinion mechanisms, respectively, for indicating the positions thereof and accordingly the holding force being applied to the workpiece.

3,653,287

(LATHE ATTACHMENT) APPARATUS FOR ADJUSTING THE CENTER OF A TURNING MACHINE

Rhinhold J. Zeeb, Lesterville, S. Dak.

Filed Nov. 10, 1969, Ser. No. 875,344
Int. Cl. B23b *23/02*
U.S. Cl. 82—33 A **3 Claims**



An apparatus for adjusting the supporting center for the workpiece in a turning machine to facilitate the cutting of tapers on the workpiece. The apparatus fits into the normal housing for the supporting center of a turning machine and has an elongated body extending at a substantial angle from the support center housing. An adjustable center is slidably mounted on the elongated body and can be positioned anywhere along the length of the elongated body within predetermined limits by rotating an adjusting device. The adjustable center is then locked in position to fix the degree of taper of the workpiece and to provide the required support.

ERRATA

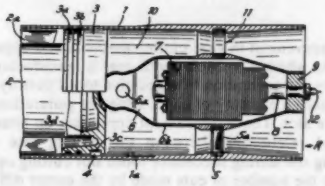
For Classes 83—82, 85—70 and 87—1 see:
Patent Nos. 3,653,293 thru 3,653,295

3,653,288

TUBULAR-SHAPED LAUNCHER FOR PROJECTILES, IN PARTICULAR FOR MISSILES

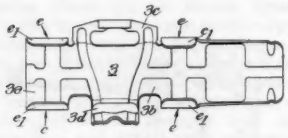
Emile Stauff, Versailles; Jean Guillot, Chatenay-Malabry; Pierre Allard, Fontenay-Sous-Bois, all of France; Johannes Schubert, Putzbrunn, near Munich; Heinz Topfer, Munich-Perlach, and Erich Prier, Munich, all of Germany, assignors to Nord-Aviation Societe Nationale De Construction Aeronautiques, Paris, France

Filed Feb. 25, 1965, Ser. No. 435,785
Claims priority, application France, Feb. 26, 1964, 965 258
Int. Cl. F41f *15/00*
U.S. Cl. 89—1.703 **9 Claims**



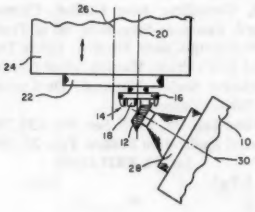
The present invention relates to a tubular-shaped launching device for projectiles, in particular for missiles.

3,653,289
CARTRIDGE BELT FEED SYSTEMS FOR AUTOMATIC WEAPONS
Bernard Maillard, Geneva, Switzerland, assignor to Brevets Aero-Mecaniques S.A., Geneva, Switzerland
Filed Dec. 4, 1969, Ser. No. 882,155
Claims priority, application Switzerland, July 14, 1969, 59100/69
Int. Cl. F42b 39/08
U.S. Cl. 89—35 A 2 Claims



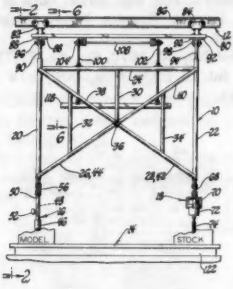
A cartridge belt feed system for automatic weapons has an ammunition bearer which feeds a cartridge belt into the weapon. The belt grips each cartridge by a link with front and rear claws, having inwardly bent tips forming flat inclined tabs lying within the apparent cross-section of the claw. The links react against the lateral lips of the insertion aperture of the ammunition bearer base-plate, through the outer lateral walls of the tabs. The inclinations of the contact and reaction surfaces of the tabs and lips are such that they co-operate reversibly and permit subsequent extraction of the cartridge in conjunction with a radial distension of the claws. The reaction surfaces may be bevels at the respective claw levels. The front bevels extend higher than the rear ones, to incline the cartridge forwards on insertion.

3,653,290
GEAR GENERATING METHOD AND APPARATUS
Ernst J. Hunkeler, Fairport, N.Y., assignor to The Gleason Works, Rochester, N.Y.
Filed June 29, 1970, Ser. No. 52,219
Int. Cl. B23f 9/10
U.S. Cl. 90—5 12 Claims



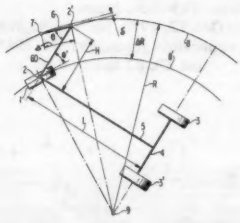
An improvement in gear cutting methods and apparatus of the type in which a multiple-tooth gear is manufactured from a blank by the generation of successive tooth slots by a cutter which makes a plurality of cuts during the generation of each successive slot. The improvement comprises an alteration in the timed relationship between the cutting rate and the generating roll during successive tooth slot cutting operations such that the number of cuts made by the cutter differs from slot to slot. While the effective contours of successive tooth slots generated by this improved method and apparatus are substantially identical, their cutting patterns differ, resulting in substantial reduction in the noise produced by power transmission systems utilizing gears generated in this manner.

3,653,291
PATTERN DUPLICATOR
Robert L. Babcock, Algonac, Mich., assignor to Bonafide Pattern, Inc., Detroit, Mich.
Filed Dec. 11, 1969, Ser. No. 884,126
Int. Cl. B23c 1/16
U.S. Cl. 90—13.2 11 Claims



A pattern duplicating apparatus including a large rigid frame suspended by trolleys from an I-beam and carrying longitudinally spaced tracer and cutter assemblies. The frame is manually displaceable linearly in the longitudinal and vertical directions and pivotally about the longitudinal axis. The frame suspension includes interconnected sprockets and chains to ensure a pure rectilinear vertical displacement.

3,653,292
AUTOMATIC CONTOUR TRACING DEVICE
Kazuo Obuchi, 220 Isaida, Kamagawa, Odawara, Japan
Filed July 2, 1970, Ser. No. 52,058
Claims priority, application Japan, July 4, 1969, 44/52947
Int. Cl. B23c 9/00
U.S. Cl. 90—62 4 Claims

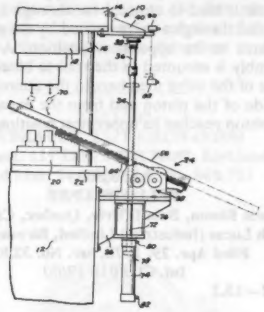


A first arm pivots about a tracing point which is spaced a fixed distance from a steering axis supporting a steering wheel which in turn is spaced at a fixed distance from a common vertical plane including a plurality of rear wheels for an automatic contour tracing device. A compensating mechanism controls both arms to satisfy a particular mathematical relationship.

3,653,293
PRESS UNLOADER
Bernard J. Wallis, 25200 Trowbridge Avenue, Dearborn, Mich.
Filed Aug. 7, 1970, Ser. No. 62,004
Int. Cl. B26d 7/06
U.S. Cl. 83—82 12 Claims

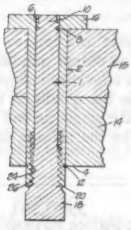
A press unloader having a reciprocating tray for receiving workpieces ejected from an upper die in a press. The tray is

shifted to the work-receiving position at a rate controlled by the upward rate of the press ram and is rapidly retracted at a



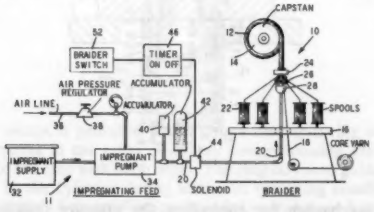
rate independent of the rate of the press ram so that the next workpiece may be conveniently loaded into the press.

3,653,294
BLIND FASTENER
Edgar F. Nason, 7461 Canby Avenue, Reseda, Calif.
Filed June 27, 1969, Ser. No. 837,220
Int. Cl. F16b *13/06*
U.S. Cl. 85—70 **4 Claims**



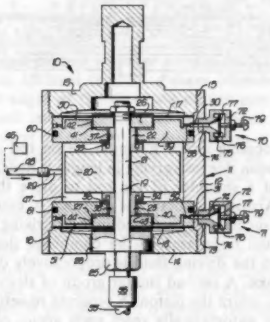
A blind fastener of two piece construction to be placed through a workpiece which is accessable only from one side which may be clamped up by conventional tooling. At installation the blind end of the core of the male core member is drawn into an annealed threaded section of the female nut member forming a bulb in the back of the work area and at the same time providing a deformed thread locking means to resist loosening under vibrations.

3,653,295
METHOD OF PROVIDING A LUBRICANT TO BRAIDED CORD
Frederick B. Pintard, Somerville, N.J., assignor to Johns-Manville Corporation, New York, N.Y.
Filed Apr. 30, 1970, Ser. No. 33,414
Int. Cl. D04c *1/00*
U.S. Cl. 87—1 **4 Claims**



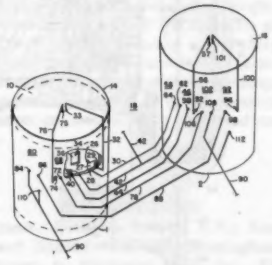
This disclosure relates to the method of impregnating a packing material with a lubricant. The impregnant is extruded by pulsations into a central portion of braided packing as it is being formed.

3,653,296
FLUID POWERED OSCILLATORY DRIVE
Wilbur H. Dexter, Inglewood, Calif., assignor to John H. Ransom Laboratories, Inc., Los Angeles, Calif., a part interest
Filed Dec. 12, 1969, Ser. No. 884,407
Int. Cl. F15b *13/02;* **F01l** *15/14*
U.S. Cl. 91—52 **4 Claims**



A high speed reciprocatory tool such as a drill has a reciprocating system including a pair of diaphragms mounted for deflection within a chamber; the diaphragms are coupled to deflect coaxially and simultaneously, there being inertial mass that moves with the diaphragms; and valve means controls transmission of motive fluid pressure from a chamber inlet to impinge against the diaphragms in alternating sequence to effect system reciprocation.

3,653,297
RECIPROCATING ENGINE
Jerry A. Peoples, 2419 Greenhill Drive, Huntsville, Ala.
Filed Feb. 27, 1970, Ser. No. 15,086
Int. Cl. F01l *21/02*
U.S. Cl. 91—184 **7 Claims**

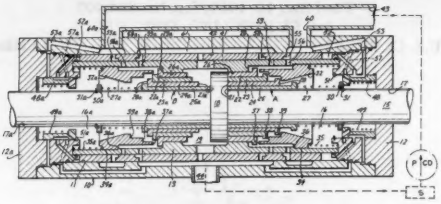


A reciprocating engine, particularly a steam engine having at least two cylinders, wherein the valving operation is achieved by means of slots in pistons co-acting with valving ports in cylinder walls of the engine.

3,653,298
RECIPROCATING FLUID MOTOR HAVING A VARIABLE DRIVE PISTON AREA

Paul J. Bilodeau, Utica, N.Y., assignor to Chicago Pneumatic Tool Company, New York, N.Y.

Filed June 3, 1970, Ser. No. 42,962
Int. Cl. F611 *25/06*; **F01b** *7/04*
U.S. Cl. 91—306 **12 Claims**

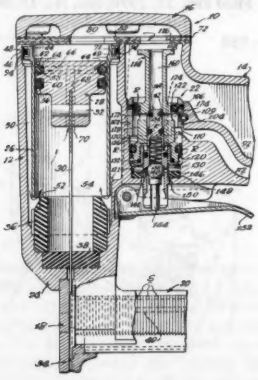


A reciprocating motor having a piston rod upon which a group of piston sleeves varying in length is hydraulically actuable against a shoulder of the rod to drive the rod in one direction. Arresting structure is provided to cause the sleeves to become successively arrested in their driving movement so that an initial large area of the combined sleeves which is subjected to the driving fluid is progressively decreased during the stroke. A second similar group of sleeves is similarly operable to return the piston. A separate re-setting element is arranged to automatically reset each group of sleeves to a driving condition preparatory to effecting the next driving stroke of the rod, and to also cushion overtravel of the rod. The rod is cooperably during its stroke with valve elements to cause automatic hydraulic feed alternately to each group of sleeves.

3,653,299
PNEUMATIC PISTON RETURN SYSTEM AND VALVE ASSEMBLY FOR IMPACT TOOLS

Frank C. Howard, Mt. Prospect, Ill., assignor to Signode Corporation, Chicago, Ill.

Filed May 11, 1970, Ser. No. 36,313
Int. Cl. F15b *15/17, 11/08, 13/042*
U.S. Cl. 91—416 **11 Claims**

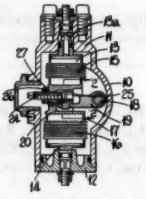


A piston return system for air cylinders in an impact tool wherein live air, when introduced into the cylinder on the pressure side of the piston, initiates the power stroke. A check valve by-passes live air around the cylinder to an expansion chamber on the opposite side of the piston where it expands when air pressure is relieved on the pressure side of the piston to return the piston to its uppermost position. The expansion air is bled to atmosphere through a passageway in the piston and through a valve carried by the piston when the piston returns to its uppermost position. A cartridge-type valve assembly is mounted in the tool to bleed air through a bore in one of the valve members to the atmosphere from the pressure side of the piston and from the expansion chamber when the piston reaches its uppermost position.

3,653,300
BELLOWS UNIT

Joseph Lewis Bloom, Baie D'Urfe, Quebec, Canada, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Apr. 29, 1970, Ser. No. 32,821
Int. Cl. F01b *19/00*
U.S. Cl. 92—13.2 **5 Claims**

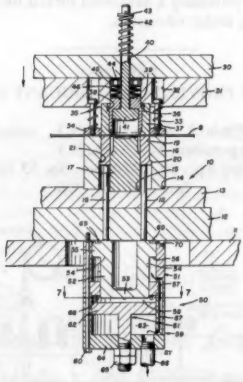


The invention relates to a bellows unit in which expansion of a bellows rotates an output spindle. The spindle is engaged with the bellows via a lever arm formed with recesses at different distances from the spindle. A thrust member is locatable in any recess and engages an end of the bellows, whereby the torque exerted by the bellows on the spindle is adjustable.

3,653,301
DRAWING PRESS PRESSURE CONTROL

William H. Clendenin, Massillon, and Thomas B. Paumier, Canton, both of Ohio, assignors to Paumier, Inc., Canton, Ohio

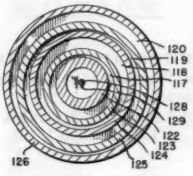
Filed July 6, 1970, Ser. No. 52,167
Int. Cl. F01b *7/00*
U.S. Cl. 92—62 **7 Claims**



A mechanism for controlling the pressure resisting the stroke of a drawing press consists primarily of two fluid actu-

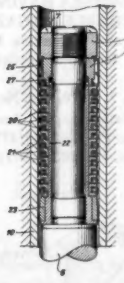
ated control pistons. The drawing stroke is first resisted by only one of the pistons and then, after a predetermined amount of movement, is resisted by both pistons. The time which the stroke is resisted only by the first piston can be varied according to the physical properties of the material being drawn so that undesirable distortions in the article being manufactured are avoided.

3,653,302
HYDRAULIC LIFT MECHANISM
Leo J. Notenboom, 121 Lake Street South, Kirkland, Wash.
Filed Mar. 24, 1969, Ser. No. 809,751
Int. Cl. F01b *7/20*
U.S. Cl. 92—53 **5 Claims**



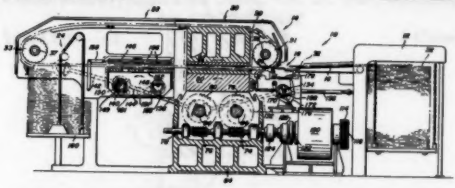
Double acting telescoping hoists are coupled by a common fluid control system for raising and lowering a platform connected to the hoists. The hoists have expansion and retraction chambers for inwardly and outwardly telescoping the hoists with the areas on which fluid acts being greater in the expansion chambers than in the retraction chambers. The force created by fluid in the retraction chambers causes each hoist to experience substantially the same load thereby enabling them to expand at substantially the same rate. In one embodiment non-concentric shaped spacers separate the telescoping units of the hoists to prevent their rotation.

3,653,303
GUIDE MEANS FOR A PISTON IN A CYLINDER
Alfred Zurcher, Winterthur, Switzerland, assignor to Sulzer Brothers, Ltd., Winterthur, Switzerland
Filed Apr. 21, 1970, Ser. No. 30,420
Claims priority, application Switzerland, Apr. 24, 1969, 6229/69
Int. Cl. F01b *31/00*
U.S. Cl. 92—162 **10 Claims**



The piston is provided with a thin-walled split ring which has grooves in the outer periphery communicating the end faces of the ring with each other. The ring serves to guide the piston in the cylinder during abnormal operating conditions and is made of an antifriction material so that wear between the piston and cylinder is reduced to a minimum.

3,653,304
APPARATUS FOR CUTTING AND CREASING SHEETS
Franz Lenoir, Marcinelle, Belgium, assignor to Miller Printing Machinery Co., Pittsburgh, Pa.
Filed Oct. 23, 1970, Ser. No. 83,335
Int. Cl. B31b *1/16;* **B26d** *7/18;* **B31b** *1/86*
U.S. Cl. 93—58.3 **14 Claims**

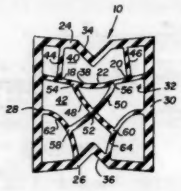


The cutter and creaser includes a sheet feeder that feeds sheets down an inclined ta' 'e to a sheet transfer unit. The front and side edges of the sheet are moved into register in the transfer unit and accelerated to press speed. The front edge of the sheet is engaged by grippers on a transverse gripper bar and conveyed through the press by an endless chain conveyor device. The press unit includes a cutter and creaser section, a stripper section and a delivery section. The cutter and creaser section has a lower platen mounted on a pair of eccentric shafts that provide a non-circular oscillatory type motion for the upper horizontal surface of the lower platen. The motion imparted to the upper surface of the lower platen has both horizontal and vertical components. An upper platen is positioned in overlying relation with the lower platen and is supported for horizontal movement in the press side frames. The upper platen is connected to the lower platen so that the upper platen reciprocates horizontally with the lower platen. The sheet conveyed by the endless chain gripper mechanism is positioned between the platens as the lower platen moves upwardly into abutting relation with the upper platen so that the elements on either the upper or lower platen cut and crease the sheet between the platens. The sheet is thereafter transferred by the conveyor mechanism to a stripper section where the cutout portions are removed from the sheet by means of dies in an upper stripper platen. The lower stripper platen is also mounted on a pair of eccentric shafts and is arranged to move the upper horizontal surface in a similar non-circular oscillatory path with both horizontal and vertical components and into abutting relation with the upper platen. The upper platen is slidably supported in the press side frame members and connected to the lower platen for horizontal reciprocatory motion therewith. The grippers on the endless conveyor chains convey the sheet from the stripper section to the delivery section where the grippers open and the sheets are released and stacked on a receiver. The drive means for the various sections of the cutter and creaser includes a single motor that is drivingly connected to both of the eccentric shafts in the cutter and creaser section. Gearing and shafting connects one eccentric shaft in the cutter and creaser section with the drive mechanisms in the transfer section, the stripper section and the delivery section so that all of the components of the cutter and creaser are mechanically connected and driven in timed relation.

3,653,305
SEALING DEVICE
Mario R. Trieste, Rockville Centre, N.Y.; Kenneth Hall, Saginaw, and Samuel McCrady, Birmingham, both of Mich., assignors to Elastomer Seals, Inc., Birmingham, Mich.
Filed Sept. 2, 1970, Ser. No. 69,014
Int. Cl. E01c *11/10*
U.S. Cl. 94—18 **1 Claim**

A comparatively wide, extruded elastomeric sealing strip, for sealing expansion grooves in bridges or the like, having a

wall construction including a transversely oriented internal wall to resist lateral compression thereof and a criss-crossed arrangement of walls supporting the transverse wall from below, such wall construction having the unique feature of a



sufficient number of internal walls as to obviate a length in any one such wall that might collapse under its own weight prior to completion of the curing of the elastomeric, and yet not having that great a number of walls as to complicate the fabrication of the device by extrusion.

3,653,306

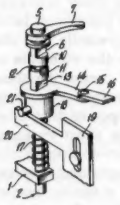
WATERPROOF CAMERA ACTUATING MECHANISM

Sho Takahama, Takarazukashi, Japan, assignor to Minolta Camera Co., Ltd., Osaka, Japan

Filed Mar. 3, 1970, Ser. No. 16,176

Int. Cl. G03b *17/08, 17/38*

U.S. Cl. 95—11 W **8 Claims**



An operating mechanism for a waterproof camera includes a rotatable axially movable shaft projecting through a bore in the camera housing and sealed thereto by an O-ring. A shoulder carried by the shaft engages the camera shutter release member and a lever slideably engages the shaft and is rotatable therewith and is linked to the camera film advancing and shutter cocking member so that depression of the shaft actuates the shutter release and rocking of the shaft by an external lever slideably engaging the shaft actuates the film advancing and shutter cocking member.

3,653,307

DEVICE FOR COMPENSATING CYLINDRICAL DISTORTION IN PANORAMIC AERIAL PHOTOGRAPHS

Gerard Andries Scheltema De Heere, Pijnacker, and Rinze Veenenga Kingma, Delft, both of Netherlands, assignors to N.V. Optische Industrie de Oude Delft, Delft, Netherlands

Filed Aug. 25, 1969, Ser. No. 852,696

Claims priority, application Netherlands, Aug. 29, 1968, 6812263

Int. Cl. G03b *29/00*

U.S. Cl. 95—12.5 **4 Claims**

For compensating cylindrical distortion in panoramic aerial recordings an array of parallel light conducting fibers is used whose entrance surface is concave and circle-cylindrical, and whose exit surface has a convex cylindrical shape so calculated that the cylindrical distortion of a panoramic

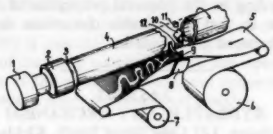


image focused on the entrance surface of the array, or of an original aerial photographic transparency placed on that surface, is compensated for the exit surface.

3,653,308

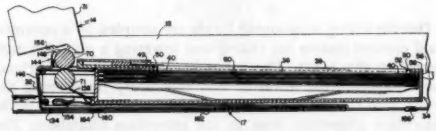
PHOTOGRAPHIC APPARATUS

Irving Erlichman, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 2, 1970, Ser. No. 179

Int. Cl. G03b *17/52*

U.S. Cl. 95—13 **40 Claims**



Variable geometry photographic apparatus for carrying a photosensitive element from an exposure position through a plurality of pressure-applying rollers a distance sufficient to clear the rollers, and then returning the photosensitive element to the main body of the photographic apparatus. A lighttight drawer is utilized which only temporarily alters the normal fixed geometry and volume of the photographic apparatus so that processing of the photosensitive element can begin almost immediately after exposure. This temporary altering of the normal fixed geometry of the photographic apparatus enables the static dimensions of the photographic apparatus to be held to a minimum while producing a developed photosensitive element in a minimum time after exposure.

3,653,309

PHOTOGRAPHIC CAMERA HAVING ONE OR MORE DETACHABLE MAGAZINES

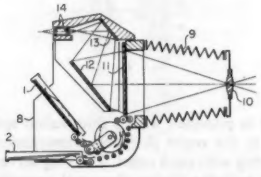
Kohei Ochiai, Tokyo, and Kiyoakira Kato, Chiba, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 7, 1970, Ser. No. 26,352

Claims priority, application Japan, June 14, 1969, 44/47223; June 17, 1969, 44/47746

Int. Cl. G03b *19/10*

U.S. Cl. 95—24 **6 Claims**



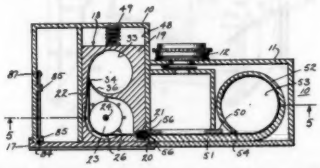
Photographic camera having a view finder and a detachable film cassette and comprising film feed means for auto-

matically feeding film sheets in the cassette to the film exposure frame one by one after the exposure thereof and for returning the respective exposed film sheets to the same cassette or to another cassette detachably mounted on the camera. The film feed means is energized by the operation of a handle thereof and comprises roll means driven by the energization of the film feed means for feeding and guiding the film sheets.

3,653,310
SYSTEM FOR TAKING AND PROCESSING STILL PICTURES

John H. Van Osch, 3415 Honey Creek Court, Milwaukee, Wis.

Filed Oct. 22, 1965, Ser. No. 501,321
Int. Cl. G03b *19/04*
U.S. Cl. 95—31 **21 Claims**

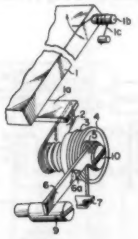


A camera incorporating a roll film magazine which is enclosed in the body of the camera and which has no openings except a light tight slot through which the film can be moved out of the magazine to the exposure area and back again following exposure, by a sprocket wheel enclosed in the magazine and rotatable by a mechanical arrangement extending through the side of the magazine, which automatically interfits with cooperating drive mechanism in the camera.

3,653,311
SHOCK ABSORBER (SHOCK ISOLATION DEVICE) FOR MIRROR OF SINGLE-LENS REFLEX CAMERA

Akihiko Sato, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Mar. 13, 1970, Ser. No. 19,336
Claims priority, application Japan, Mar. 27, 1969, 44/26697
Int. Cl. G03b *19/12*
U.S. Cl. 95—42 **1 Claim**

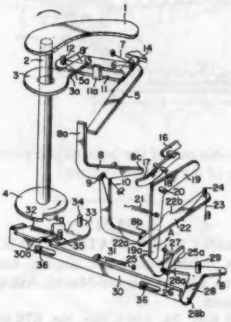


A shock absorber assembly for a hinged mirror of a single-lens reflex camera for reducing the noise and shock caused by the downward movement of the mirror. The absorber assembly is disposed at a position where the mirror is held stationary when the mirror is lowered. When the mirror is lowered it engages with the absorber assembly with the downward impact energy of the mirror being absorbed as friction between a drum and a coil spring. The mirror stops after it passes over its regular reflecting position and then is caused to return to its regular reflecting position by the action of a return spring.

3,653,312
FILM WINDING DEVICE FOR SINGLE-LENS REFLEX CAMERA

Hidenobu Kondo, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Nov. 24, 1970, Ser. No. 92,419
Claims priority, application Japan, Nov. 27, 1969, 44/112101
Int. Cl. G03b *19/12*
U.S. Cl. 95—42 **1 Claim**

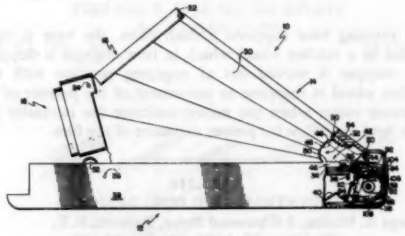


A film winding device for a single-lens reflex camera which eliminates the necessity of effecting preliminary ineffective exposure operations, that is, so called "blank" exposures after the film loading by the use of a simple mechanism utilizing various parts employed in the conventional camera and only requiring a few additional parts.

3,653,313
EXPOSURE COUNTER FOR SINGLE-LENS REFLEX CAMERA

Robert D. Leduc, Marlboro, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 29, 1970, Ser. No. 102,435
Int. Cl. G03b *19/12*
U.S. Cl. 95—42 **10 Claims**



A camera of the single-lens reflex type having a reflecting member mounted for movement between first and second positions and an exposure counter coupled to an actuated by the movement of the reflecting member between the first and second positions. The camera also includes a lever and pawl system for automatically resetting the exposure counter upon removal of a film container from the camera.

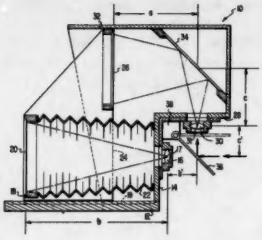
3,653,314
TWIN LENS PARALLAX FREE CAMERA SYSTEM

Carl C. Swann, 1334 Belmeade Forest, Kingsport, Tenn.

Filed Mar. 9, 1970, Ser. No. 17,548
Int. Cl. G03b *3/00, 3/04*
U.S. Cl. 95—44 A **9 Claims**

A camera system having a picture taking lens and a view finder lens positioned at some suitable angle to each other and a reflector positioned between the lenses at an angle

bisecting the angle formed with respect to a line through the center of each lens used as a means of focusing the camera



system and movable out of the path of the picture taking lens before actuation of the camera shutter.

3,653,315
FLASH CUBE ROTATING DEVICE

Susumu Fukuda, Nishinomiya-shi, Japan, assignor to Fuji Photo Film Co., Ltd., Ashigara-Machi, Ashigara-Kamigun, Kanagawa, Japan

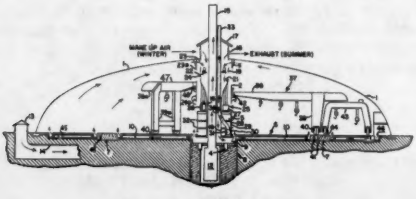
Filed Nov. 24, 1969, Ser. No. 879,071
Claims priority, application Japan, Nov. 27, 1968, 43/103428
Int. Cl. G03b *17/38*
U.S. Cl. 95—11 L **4 Claims**

A rotating base supports a flash cube, the base is connected to a ratchet wheel which in turn engages a stopper, The stopper is moved out of engaging position with the ratchet wheel in response to movement of the pointer of an exposure meter when the meter indicates the necessity for flash light operation for proper exposure of the film.

3,653,316
INDUSTRIAL BUILDING DESIGN

George A. Moline, 8 Glenwood Drive, Ballston, N.Y.

Filed Nov. 27, 1970, Ser. No. 93,181
Int. Cl. F24f *13/00*
U.S. Cl. 98—33 **7 Claims**

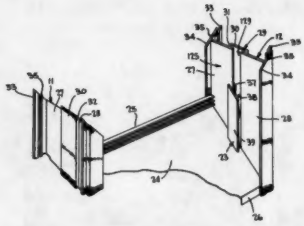


An industrial building has an annular shell and is supported at its center by a vertical structural support framework. Within the central support framework are the support facilities together with a major portion of the heating and ventilating system. The power requirements and the heating relationship for ventilating air are provided by a combustion powerplant within the building.

3,653,317
LOUVERS

Nicholas Joseph Costanzo, Jr., 5106 Brentford Road, Rockville, Md., assignor to Etelson, Costanzo & Associates, Silver Spring, Md.

Filed Dec. 22, 1969, Ser. No. 887,068
Int. Cl. F24f *13/00*
U.S. Cl. 98—110 **16 Claims**

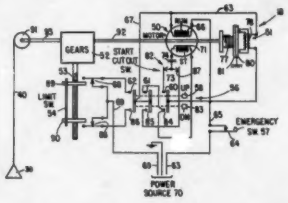


A louver includes a sill, header and jambs, all having the same cross section including a wall with a longitudinally extending slot therein. Spacers are inserted in the slot of each jamb and include means extending beyond the jamb wall toward the other jamb for supporting louver blades. The blades have a uniform cross section throughout the length thereof which is slightly less than the separation between the walls of the two jambs. In an embodiment wherein the blades are fixed, the spacers have sloping top and bottom edges which cooperate with flanges on the jambs for holding the blades in situ. In another embodiment wherein the blades are pivotable, the spacers include fingers which fit into slots in the blades.

3,653,318
COMBINED VENTILATING AND ILLUMINATING APPARATUS

Ron Shimosawa, Chicago, Ill., assignor to Kiku Co., Chicago, Ill.

Filed June 2, 1970, Ser. No. 42,799
Int. Cl. F23j *11/00*
U.S. Cl. 98—115 **10 Claims**



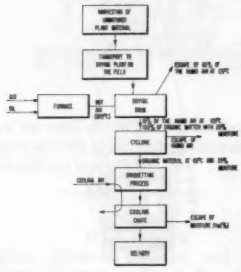
An apparatus for use in connection with a dining table in a restaurant on which food is cooled, heated, and the like, and eaten, the apparatus comprising a vertically extending retractable ventilating duct with a hood which extends over the table and which serves to suck up the hot gases and odors emanating from the table and to withdraw same from the room. The retractable ventilating duct telescopes into and out of a hidden section normally positioned above a false ceiling. The said hood also has illuminating means to illuminate the table area.

3,653,319

METHOD FOR BRIQUETTING GRASS AND SIMILAR GREEN CROPS

Alfred T. Nielsen, Holte, Denmark, assignor to Unidry K/S Engineering and Development Group, Copenhagen, Denmark

Filed Feb. 9, 1970, Ser. No. 10,047
Claims priority, application Denmark, Feb. 10, 1969, 719/69
Int. Cl. B30b *15/34*
U.S. Cl. 100—38 1 Claim



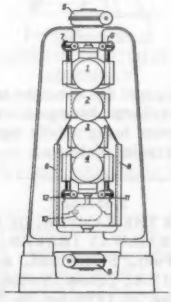
In the manufacture of fodder briquettes, especially for ruminants, the green crops are artificially dried to a moisture content of 15–22% and, while at a temperature of 45°–65° C. (110°–150 F.), are fed to a reciprocating briquette press for being compressed to a specific weight of 0.7–0.9 grams per $cm.^3$. The briquette rod produced is cooled while passing through a guide pipe somewhat larger in diameter than the rod which is displaced through the guide pipe against a resistance to counteract longitudinal expansion of the briquette rod.

3,653,320

CALENDAR ADJUSTMENT MECHANISM

Erich Oehlmann, Kirchhorst, and Herbert Orth, Misburg, both of Germany, assignors to Hermann Berstorff Maschinenbau GmbH, Hannover-Kleefeld, Germany

Filed May 15, 1970, Ser. No. 37,690
Claims priority, application Germany, May 17, 1969, P 19 25 261.0
Int. Cl. B30b *3/04*
U.S. Cl. 100—158 2 Claims



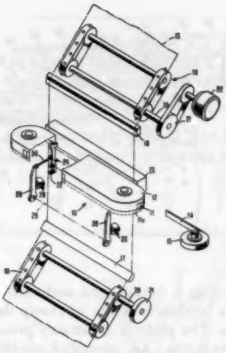
A 4 high calendar includes gears for adjusting the gaps between cooperating rolls and further gears for adjusting the obliquity of the bottom roll relatively to the next above roll in the event the lower roll deflects.

3,653,321

TYPE MOUNTING MEANS FOR HIGH SPEED FRONT PRINTER

James M. Cunningham, Bradenton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 15, 1969, Ser. No. 884,953
Int. Cl. B41j *7/38, 1/20*
U.S. Cl. 101—93 C 6 Claims



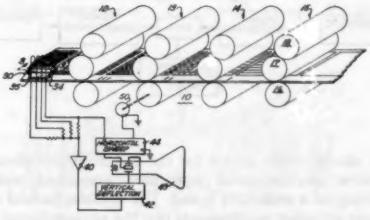
In a high speed front printer a type cartridge comprises a plurality of type carriers guided along a print line by a continuous guide rail. Each type carrier has a plurality of pivotal levers carrying raised type characters adjacent their free ends. The type carrier levers are impacted by selected type hammers in the different print positions to impact a document and a ribbon or the like for printing in selected positions as the type carriers move by the print positions.

3,653,322

REGISTER INDICATING SYSTEM

James Ivor Richardson, Montville, N.J., assignor to Harris-Intertype Corporation, Cleveland, Ohio

Filed Aug. 5, 1969, Ser. No. 847,611
Int. Cl. B41f *13/24*
U.S. Cl. 101—248 15 Claims



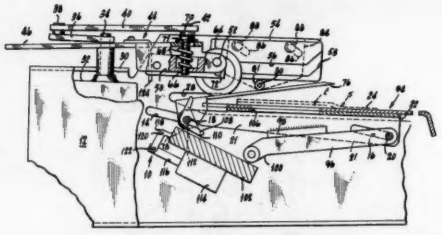
Multi-unit machine for operating on sheet material in web form or in the form of individual sheets with the operations performed by each unit to be in precise registry with the operations performed by the other units. Each unit applies a register mark to the sheet material which has a fixed position relative to the operation of the unit on the sheet material. The register marks are scanned as a group to provide output signals for checking the timing of the units. The output signals are pulses which are combined to provide a predetermined pulse pattern when the units are in registry and different pulse patterns when one or more of the units is out of registry. A cathode ray tube is utilized to display the pulse patterns.

3,653,323

CARD POSITIONING AND PRINTING UNIT FOR CREDIT CARD READING AND IMPRINTING EQUIPMENT

Jared McGowan, Lansdale; John Di Lello, Warminster, and Edward Kelly, Philadelphia, all of Pa., assignors to Credit Systems, Inc., Colmar, Pa.

Filed Nov. 3, 1969, Ser. No. 873,384
Int. Cl. B41f 3/20
U.S. Cl. 101—269 6 Claims



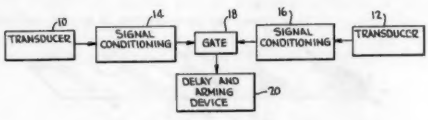
A tray supporting a credit card and sales slip, when advanced, causes a hold-down plate to clamp the card and slip in print position. The plate is adjustably presettable to meet customer requirements. An operating mechanism drives a spring-loaded printing roller to imprint the slip, and has a long-stroke capability to increase the pri area. The insertion of a card allows imprinting either from the side or end of the slip anywhere along its length and also allows extension of the credit card legend longitudinally of the path of roller travel to improve print quality.

3,653,324

ELECTRONIC DEVICE APPLICABLE TO ORDNANCE SAFETY AND ARMING SYSTEMS

John J. Furlani, Rockville; Harry J. Davis, Wheaton, both of Md., and Philip Ingersoll, Fairfax, Va., assignors to The United States of America as represented by the Secretary of the Army

Filed Feb. 10, 1970, Ser. No. 10,173
Int. Cl. F42c 11/02, 11/06, 15/40
U.S. Cl. 102—70.2 R 7 Claims



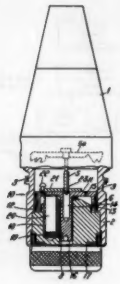
An all-electronic device for the detection and processing of those environmental signatures associated with the launching of a munitions round. The non-mechanical device imposes stringent requirements that the environmental signatures must meet before the device will issue a command signal to arm the round. Two transducers are utilized to sense two distinct conditions that are peculiar to the round's launching. In a particular embodiment, the two transducers used are a piezoelectric crystal that senses acceleration setback and a magnet and coil arrangement that is triggered when the round leaves the gun barrel. Furthermore, the environmental signatures that are sensed must fall within certain voltage ranges and time intervals that have been preselected according to the particular weapon and round combination under consideration. When the various signals meet all requirements, the device will provide a useable signal for any subsequent delay and arming function of the round.

3,653,325

DELAYED ARMING DEVICE FOR THE PROXIMITY FUSE OF A BOMB

Jakhin Boaz Popper, Kiryat Motzkin, Israel, assignor to The State of Israel, Ministry of Defense, Hakiria, Tel Aviv, Israel

Filed Feb. 25, 1969, Ser. No. 802,110
Claims priority, application Israel, Feb. 27, 1968, 29536
Int. Cl. F42c 13/00, 15/12, 15/28
U.S. Cl. 102—70.2 P 4 Claims



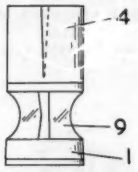
A proximity type bomb fuse provided with means designed to ensure that the full arming of the fuse is delayed sufficiently for the bomb to have become separated from its point of release or propulsion by a safe distance.

3,653,326

WADS FOR CARTRIDGES

Peter John Howsam, 10 St. Margaret's Avenue, Nottingham, and John Dalton Barton, 12 Nottingham Road, Lowdham, both of England

Filed Feb. 4, 1970, Ser. No. 8,542
Claims priority, application Great Britain, Feb. 12, 1969, 07,480/69
Int. Cl. F42b 7/08
U.S. Cl. 102—95 7 Claims



A one piece plastic wad for a shotgun cartridge forming a cover for the powder charge, having conical leaves forming a shot pouch, the leaves being axially separated with their edges inclined to the radius of the wad.

3,653,327

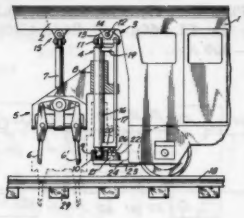
MACHINE FOR THE TAMPING OF BALLAST OF RAILWAY TRACKS

Gerard Sauterel, Pully, Switzerland, assignor to Matisa Materiel Industriel S.A., Crissier, Switzerland

Filed Mar. 20, 1970, Ser. No. 29,332
Claims priority, application Switzerland, Mar. 24, 1969, 4371/69
Int. Cl. E01b 27/16
U.S. Cl. 104—12 18 Claims

This invention comprises railway track tamping units which are displaceable in height and comprise pairs of tools

working in opposition, are arranged on either side of the same line of rails and that the height displacement of each of them is controlled by an independent mechanical member

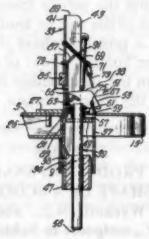


having one of its ends articulated to a fixed support of the machine chassis and the other end displaceable at least transversally to the railway track axis.

3,653,328
TOW TRUCK

Guy R. Abram, Montreal, Quebec, and Emil Offerman, Therese West, Quebec, both of Canada, assignors to Matthew Moody Ltd., Terrebonne, Quebec, Canada

Filed Jan. 5, 1970, Ser. No. 537
Int. Cl. B65g *17/42*
U.S. Cl. 104—172 BT **10 Claims**

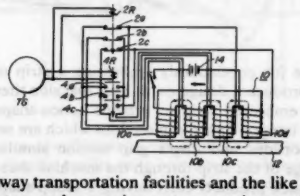


A tow pin attachment for tow trucks. The attachment can be removably connected to a tow truck. A tow pin carried by the attachment is movable between operative and inoperative positions. Means on the tow pin lock the attachment to the truck when the tow pin is in operative position.

3,653,329
ELECTROMAGNETIC TRACTION INCREASING ASSEMBLY

Akio Sasaki; Hiroshi Sakata, and Nobuyoshi Tsuboi, all of Katsuta-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sept. 18, 1969, Ser. No. 858,949
Claims priority, application Japan, Sept. 20, 1968, 43/67612
Int. Cl. B61c *15/04*; H02k *49/04*; H02p *15/00*
U.S. Cl. 105—77 **3 Claims**

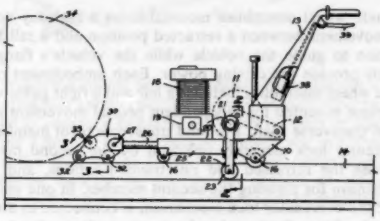


In railway transportation facilities and the like having a rail track system and a running system running on the rail track by means of running wheels, a system for increasing the axle load having a plurality of magnetic poles disposed in one of the two systems for producing magnetic flux, and a magnetic material disposed in the other system for producing an attractive force between the two systems by the action of the magnetic flux and a braking effort by the transfer movement of the magnetic flux, wherein the magnetic poles are energized within a speed range in which the product of the attractive force and the coefficient of adhesion is greater than the braking effort.

3,653,330
PORTABLE WAGON SHIFTER

William James Yard, Cavan, South Australia, Australia, assignor to Aresco Trak-Chief Proprietary Limited, Cavan, South Australia, Australia

Filed Dec. 24, 1969, Ser. No. 887,919
Int. Cl. B60s *9/22*; B61c *17/00*; B61d *15/12*
U.S. Cl. 105—90 A **5 Claims**

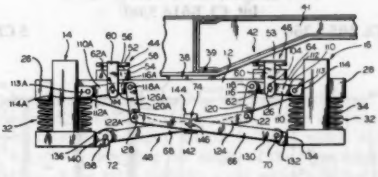


A wagon shifter or spotter arranged to run along a single rail of a railroad track and provided with a small wheel to engage the wheel of a wagon, the small wheel being carried on a hydraulic ram, and a further hydraulic ram arranged to grip the sides of the rail head, so that when the two rams operate simultaneously the rail is gripped and the wagon wheel is moved along the rail.

3,653,331
BOLSTER AND SIDE BEARING RAILWAY CAR LEVELING MECHANISM

Osvaldo F. Chierici, Elmhurst, Ill., assignor to Holland Company

Filed Dec. 8, 1969, Ser. No. 882,864
Int. Cl. B61f *5/14*, *5/24*, *17/04*
U.S. Cl. 105—199 R **9 Claims**

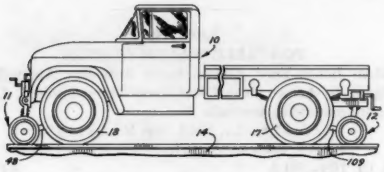


A combination bolster, side bearing, and side frame truck levelizer for railroad car trucks in which the truck bolster carries on either side of its center plate structure a side bearing that is of a constant contact type, with each bearing including a bearing plate acting on a body of resilient elastomeric material, in which the bearing plates are connected through a lost motion connection to a scissors lever type linkage assembly linking the side frames and the bolster mid portion, with the arrangement being such that roll tendencies in excess of those absorbed by the side bearings are translated into vertical movement of the bolster by applying to the bolster at its mid portion most of the unbalanced forces involved in such roll tendencies.

3,653,332
CONVERTIBLE RAIL-HIGHWAY VEHICLE

Buford W. Olson, Sr.; Eldrid W. Nelson, and Albin A. Davidson, all of Minneapolis, Minn., assignors to Chas. Olson & Sons Incorporated, Minneapolis, Minn.

Filed Feb. 12, 1970, Ser. No. 10,893
Int. Cl. B61d *15/00*; B61f *9/00*; B62d *61/12*
U.S. Cl. 105—215 C **7 Claims**

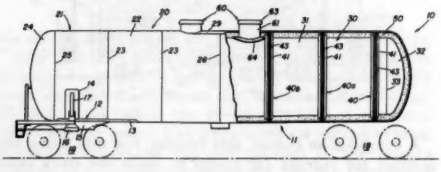


Guide wheel assemblies mountable on a highway vehicle for movement between a retracted position and a rail travel position to guide the vehicle while the vehicle's flangeless wheels provide the driving power. Each embodiment of the guide wheel assemblies includes a left and a right guide wheel subframe mounted for independent pivotal movement about a first transverse shaft, a second transverse pivot member, an overcenter lock assembly operated by the second member between the retracted and rail travel positions, and drive mechanism for pivoting the second member. In one embodiment the overcenter lock mechanism is connected to a transverse load transfer member having opposite ends pivotally connected to the adjacent subframe through a resilient mount and in a second embodiment the load transfer member provides an extensible connection having opposite ends connected to the adjacent subframe to pivot about a diagonal axis. In the third embodiment there is provided two overcenter lock assemblies, each being pivotally connected to the adjacent subframe. Also one of the embodiments includes mechanism for blocking the use of the vehicle steering mechanism for steering the vehicle. Also there is provided mechanism for properly aligning the first pivot shaft relative the vehicle.

3,653,333
HEAT-INSULATED RAILWAY TANK CARS AND A METHOD OF MAKING THE SAME

William A. Taylor, Sharpsville, Pa., assignor to General American Transportation Corporation, Chicago, Ill.

Filed Jan. 21, 1970, Ser. No. 4,506
Int. Cl. B61d *5/00*
U.S. Cl. 105—360 **5 Claims**

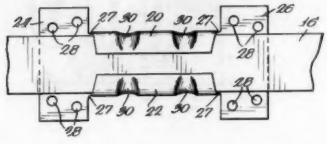


There is disclosed a heat-insulated railway tank car and a method of making the same, comprising positioning one or more barriers on an elongated inner liner, the barrier having a flexible portion and a rigid portion, sliding an elongated outer shell onto the inner liner while radially compressing the flexible portion of the barrier, the barrier thus defining separate fluidntight compartments between the inner liner and the shell, and filling the compartments with an insulating substance.

3,653,334
METHOD AND APPARATUS FOR ABSORBING IMPACT FORCES

William A. Meier, Roselle, Ill., assignor to Signode Corporation

Filed Mar. 27, 1970, Ser. No. 23,264
Int. Cl. B60p *7/10*; B61d *45/00*
U.S. Cl. 105—369 A **8 Claims**

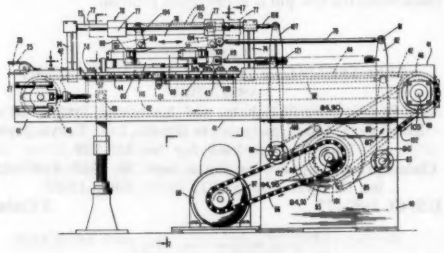


The practice of the method disclosed herein acts to absorb the effect of impact forces placed on articles shipped in a railroad car, or other moving vehicle, to prevent or minimize movement of the articles relative thereto. A strap adapted to be disposed about a package being transported is located within a cushion seal, which is subsequently crimped to interlock the strap and seal. The seal is then secured to the base of the transporting member, which will act to absorb the imposed shock loads. The impact energy on the strapped article is converted into heat due to the high friction developed tending to move the strap through the cushion seal. With the cushion seal disclosed herein, a controlled slippage of the strap and thus controlled movement of the article is obtained, which prevents the article from becoming damaged due to hitting the end of the car, or another article in the car, or from sliding into a position where it would block an unloading doorway. The holding power of the cushion seal is of lesser magnitude than the strap tensile force, so that the article will move before the strap is broken.

3,653,335
MACHINES FOR PRODUCING SNACK FOOD IN THE SHAPE OF A SCOOP

Arthur J. Griner, Wyckoff, N.J., and William A. Blain, Spring Valley, N.Y., assignors to Nabisco, Inc.

Continuation of application Ser. No. 754,415, Aug. 21, 1968, now abandoned. This application Aug. 20, 1970, Ser. No. 65,727
Int. Cl. A21c *11/10*
U.S. Cl. 425—307 **34 Claims**



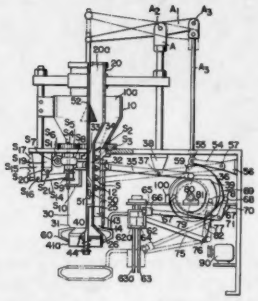
A machine for continuously embossing a strip of edible material to produce a design on at least one side thereof and shaping the embossed strip to provide spoon-shaped body portions and integral finger grip sections which are severed in said body portions and finger grip section simultaneously during passage of the strip through the machine thus forming individual snack products each having a scoop-shaped body portion and a finger grip portion for use in spooning prepared dip mixtures as currently used at social gatherings.

3,653,336

AUTOMATIC MOLDING APPARATUS FOR PRODUCING RING-SHAPED DOUGHNUTS CONTAINING FILLINGS

Ryutano Kaneko, and Yoshio Kaneko, both of 1-8, Sannoncho, Minami-ku, Yokohoma-shi, Japan

Filed Oct. 19, 1970, Ser. No. 82,057
Claims priority, application Japan, Oct. 22, 1969, 44/84053
Int. Cl. A21d *11/16*
U.S. Cl. 425—133 11 Claims



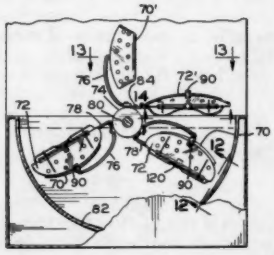
An automatic molding apparatus for producing ring-shaped doughnuts with one or more kinds of filling contained therein in annular form, wherein uncooked dough and filling are separately stored in coaxially arranged hoppers, each of which has an inlet opened at the upper end to allow the raw material to be easily charged at a desired time under atmospheric pressure without stopping the apparatus; the dough is squeezed out at predetermined intervals from an annular opening defined between two cylindrical outlet pipes; the filling such as cream or jam is drawn out, also at predetermined intervals, from an annular opening positioned within the hole of the preliminarily formed dough so as to be completely wrapped in the dough; the mixed mass being taken out of the apparatus to be subjected to frying or other means of cooking in the succeeding process.

3,653,337

FOOD COOKING APPARATUS

Roger H. Hanson, 808 47th Street South, Great Falls, Mont.

Continuation-in-part of application Ser. No. 659,634, Aug. 10, 1967, now abandoned. This application Feb. 26, 1970, Ser. No. 14,340
Int. Cl. A23p *1/00*
U.S. Cl. 425—394 15 Claims



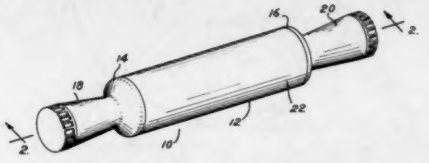
A taco is manufactured from a tortilla cake in an apparatus which folds the tortilla cake between a male member shaped substantially like the desired finished taco and a female member which closes thereagainst providing a centrally creased taco having angularly related sides. At the end of such crease, end forming members move angularly upwardly against the end portions of the tortilla cake to form end gussets gathered between the sides of the taco as end folds or pleats. These end gusset portions are desirably somewhat thicker than the remainder of the taco to avoid cracking.

3,653,338

HOLLOW POLYETHYLENE ROLLING PIN

William R. Sauey, Baraboo, Wis., assignor to Flambeau Plastics Corporation

Filed Sept. 17, 1970, Ser. No. 73,055
Int. Cl. A47j *43/00*
U.S. Cl. 29—110.5 5 Claims



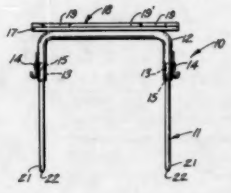
An improved rolling pin is provided which includes a hollow cylindrical center member formed of polyethylene and adapted to contain a freezable gel which includes an aqueous celluosic filler. A pair of hollow handles are provided for sealing the ends of the hollow cylindrical center member. The hollow handles are adapted to contain an insulating material such as polystyrene for insulating the freezable gel.

3,653,339

MULTIPURPOSE TABLE

Thomas M. Hester, Sr., 55875 Mount View Trail, Yucca Valley, Calif.

Filed Apr. 16, 1970, Ser. No. 33,116
Int. Cl. A47f *5/12*
U.S. Cl. 108—1 1 Claim



A table for many uses, such as reading, writing, etc. This table includes a tubular frame having the free end slideable within an inverted U-shaped tubular member which includes spring means for adjusting the height of the front edge. The top portion of the table includes a rail which is removeable, the rail having recessed portions to form arm rests and a book rest.

3,653,340

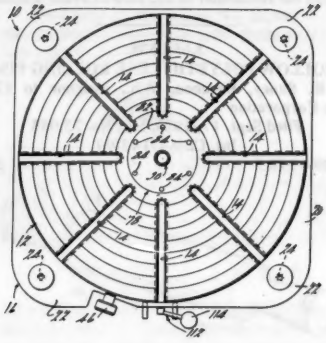
ROTARY TABLE

Charles H. Bugg, Mount Clemens, Mich., assignor to Machine Products Corporation, Detroit, Mich.

Filed July 1, 1970, Ser. No. 51,598
Int. Cl. A47b *11/00*
U.S. Cl. 108—139 8 Claims

A free-wheeling rotary table comprising a base member, a horizontally disposed rotatable table member adapted to support an object for rotation about a generally vertical rota-

tional axis, antifriction bearing means on one of the members arranged generally coaxially of the rotational axis, and a bearing surface on the other of the members engageable with



the bearing means and defined at least in part by an imaginary sphere having its center located along the rotational axis of the table member.

3,653,341

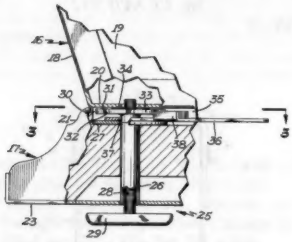
LEVELING DEVICE FOR POOL TABLES

Otto Sevenen Nielsen, 4875 Sorill Avenue South, Minneapolis, Minn.

Filed Aug. 26, 1970, Ser. No. 70,627

Int. Cl. A47b *9/00;* **F16m** *11/12, 11/24*

U.S. Cl. 108—144 **5 Claims**



A pool table comprises a table top having a pair of leg structures secured thereto. Each leg structure is provided with a pair of leveling devices, each of which includes a vertical threaded foot member having a floor engaging element on the lower end thereof. Each foot member is threadedly engaged by a threaded foot shifting member which may be revolved by an actuating lever in either direction to cause vertical movement of the table while each foot member remains stationary. The actuating lever is provided with indicia (up or down) to readily apprise a user of the direction the foot member is being shifted.

3,653,342

MEANS FOR DISCOURAGING THEFT

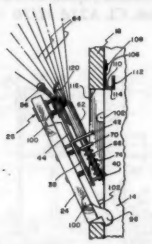
Homer S. Chilton, Wichita, Kans., assignor to Music Service Company, Inc., Wichita, Kans.

Filed July 21, 1970, Ser. No. 56,836

Int. Cl. G08b *15/02, 13/08*

U.S. Cl. 109—31 **15 Claims**

Theft prevention apparatus associated with a key locked door or closure, such apparatus including a striker normally cocked to strike a container of a pressurized mixture of tear gas and marking dye and thereby causing release of the mixture, a trigger is provided that is movable into and out of a position preventing striker movement by the key lock mechanism as the latter is operated by the key lock respec-



tively to unlock and lock the closure. The striker is associated with a means for preventing operation thereof solely when the closure is in its closing position, whereby the striker is released if the closure is opened and the key lock has not been moved to its unlocking position.

3,653,343

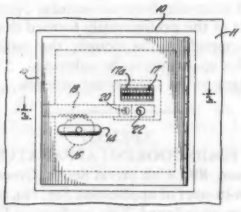
PERSONAL HOTEL SAFE

Hilda Y. E. McMartin, Elephant Walk, Tucker's Town, Bermuda

Filed Nov. 9, 1970, Ser. No. 87,845

Int. Cl. E05g *1/00;* **E05b** *37/02*

U.S. Cl. 109—64 **4 Claims**



The invention relates to a personal safe for installation in a hotel room and for use at the convenience of a guest. The safe has a combination lock for which the combination can be set as desired by the guest. Setting of the combination is controlled by a key-operated mechanism operable by a key furnished by the hotel. The key-operated mechanism is associated with a movable member which secures the safe in closed or locked condition and access to the key-operated mechanism is provided only when the movable member is in unlocked condition.

3,653,344

AIR POLLUTION DEVICE

Miles Gregory Masek, and Sophia D. Masek, both of 1558 Janquil Terrace, Ill.

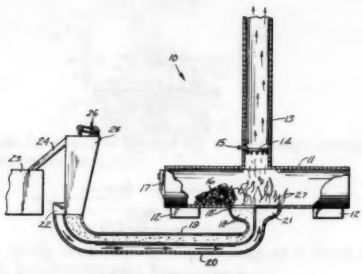
Filed July 22, 1970, Ser. No. 57,099

Int. Cl. F23g *5/00*

U.S. Cl. 110—8 A **3 Claims**

A natural gas burning device for preventing air pollution. This device serves to completely burn smoke particles, carbon, sulfur-gases and the like that have been accumulated by

the burning of coal and garbage. The device includes a gas jet above the furnace containing the garbage and coal, the



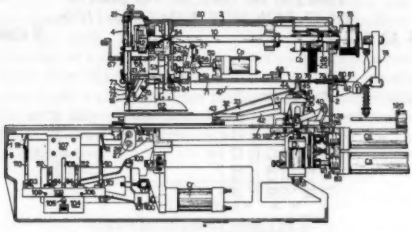
gas burner serving to completely burn the smoke particles and gasses.

3,653,345

SEWING MACHINE FOR MAKING WELTED POCKETS

Nereo Bianchi, Pavia, Italy, assignor to Necchi, Societa per Azioni, Pavia, Italy

Filed July 27, 1970, Ser. No. 58,577
Claims priority, application Italy, July 30, 1969, 32417 A/69
Int. Cl. D05b *3/10*
U.S. Cl. 112—65 **5 Claims**



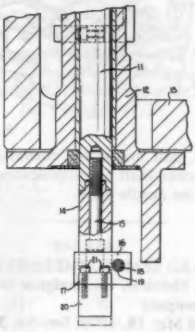
Sewing machine for making welted pockets comprising an arm carrying a driving shaft, a lock mechanism, a work plate slidable along the longitudinal axis of the machine beneath said arm, a work clamp movable with the work plate to secure thereon a piece of fabric to be sewn, a pair of lateral pressers movable with the work plate and a center blade, said pressers being provided for positioning a patch of fabric over said fabric and thereafter making a suitable folding of said patch, a pair of needles operatively connected to said driving shaft to form two parallel longitudinal stitchings on the fabrics after said folding, the fabrics moving together with the work plate, a cutter movable together with the needles to make a slit on the fabric parallel to the stitchings, vertically movable patch turners and tab slit cutters positioned below the work plate at the end of the displacement of said work plate and pneumatic means to control and actuate the operation of the machine lock mechanism, the movement of the work plate supporting the fabric, the oscillation of the patch turners and the tab slit cutters, the lateral movement of the presser members and the work clamp, pre-set control members being provided in the circuit of said driving means to determine the succession of their operation during the automatic cycle.

3,653,346

TUFTING MACHINES

Ronald Parsons, Blackburn, England, assignor to Singer Company (U.K.) Limited, London, England

Filed Oct. 12, 1970, Ser. No. 79,783
Claims priority, application Great Britain, Oct. 11, 1969, 50,026/69
Int. Cl. D05c *15/20;* **D05b** *55/14*
U.S. Cl. 112—79 R **5 Claims**



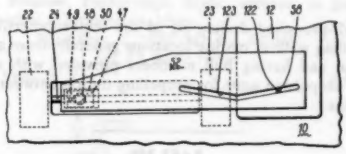
In order to provide a ready facility for adjusting the bottom dead-center position of the tufting needles of a tufting machine on needle change or needle-stroke adjustment, the push-rods upon which the needle-bar is mounted are each provided with an extension arm releasably attachable thereto, the arm having a mounting bracket thereon to receive the needle-bar.

3,653,347

AUTOMATIC APPARATUS FOR SEWING A SEAM OF A PREDETERMINED CONFIGURATION

Nereo Bianchi, Pavia, Italy, assignor to Necchi S.p.A., Pavia, Italy

Filed July 16, 1970, Ser. No. 55,314
Claims priority, application Italy, July 20, 1969, 32418 A/69
Int. Cl. D05b *21/00*
U.S. Cl. 112—121.12 **3 Claims**



A sewing machine including means for automatically sewing a seam of a particular configuration. Fabric clamp means are guided past the sewing needle by a guide means which simultaneously imparts a rectilinear and a rotative motion to the clamp means.

3,653,348

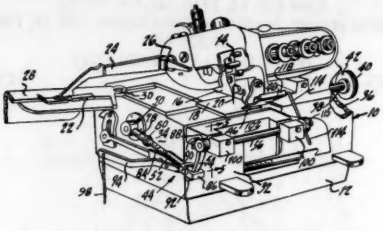
RUFFLING ATTACHMENT FOR A STITCHING MACHINE

Irving Baumhaft, Wilkes Barre, Pa., assignor to Pennsylvania Sewing Research Corporation

Filed Jan. 22, 1968, Ser. No. 699,598
Int. Cl. D05b *35/08*
U.S. Cl. 112—134 **7 Claims**

A ruffling attachment for a stitching machine of the type having a frame with front and side vertical walls, a needle plate mounted on the frame, and a drive shaft extending

through side wall. The ruffling attachment is comprised of a rocker shaft mounted on the front wall, means for converting the rotary motion of the drive shaft to oscillating motion in



the rocker shaft, and means for converting the oscillating motion in the rocker shaft to reciprocating motion of a ruffler blade above the needle plate.

3,653,349

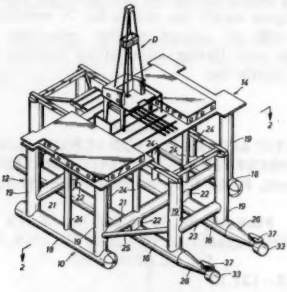
SELF-PROPELLED SEMI-SUBMERSIBLE DRILLING RIG

Elliot E. Brown, Metairie, La., assignor to Ocean Drilling & Exploration Company

Filed May 18, 1970, Ser. No. 38,218

Int. Cl. B63b *35/00*

U.S. Cl. 114—0.5 D **7 Claims**



A self-propelled drilling rig of the semi-submersible type for drilling wells at marine locations generally from an afloat position and having hull members provided with self-contained propulsion units for propelling the rig between marine locations.

3,653,350

PRESSURE BALANCING OIL SYSTEM FOR STERN TUBES OF SHIPS

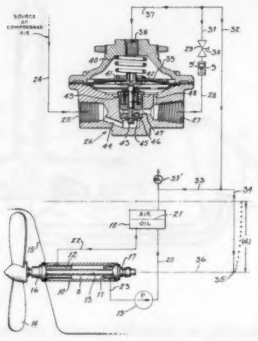
Harold O. Koons, New Berlin; Donald W. Pautz, Greenfield, and Willis W. Gardner, Waukesha, all of Wis., assignors to Waukesha Bearings Corporation, Waukesha, Wis.

Filed Dec. 4, 1970, Ser. No. 95,208

Int. Cl. B63b *35/00;* **F16j** *15/40*

U.S. Cl. 114—0.5 R **11 Claims**

The oil in the stern tube is normally maintained at a predetermined pressure. A conduit leading from a source of compressed air has an outlet in the region of the center line of the tail shaft, the air in said conduit being at a pressure to normally bleed air from the outlet, and there being valve means in said conduit between the source of compressed air and the outlet which is responsive to changes in the air pressure in the conduit, caused by changes in the draft of the ship, for varying the oil pressure in the oil chamber to maintain it at a predetermined value above sea pressure. In one form of the invention the air pressure in the conduit serves as a medium to transmit changes in the draft of the ship to the oil in a closed head tank. In another form of the invention the air pressure in the conduit acts to control the flow of oil



from an elevated head tank to thereby control the pressure in the stern tube, and in another form of the invention the air pressure in the conduit acts to control the effective pressure of the oil being delivered to the stern tube by a pressure pump.

3,653,351

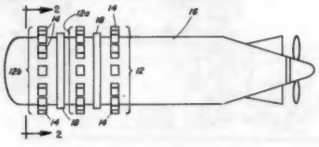
MAGNETIC DETECTOR

Raymond Gerald Martin, Ellicott City, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed July 16, 1969, Ser. No. 842,198

Int. Cl. F42b *19/34;* **F42c** *15/08, 11/09*

U.S. Cl. 114—20 R **7 Claims**



A magnetic detector for a torpedo having three rings of magnets and a pair of inducting coils alternately positioned on a torpedo body in longitudinally spaced positions thereon. Each ring of magnets and coil lies in a plane parallel to the plane of each other ring and coil and perpendicular to the longitudinal axis of the torpedo. The coils are connected in series opposition and their combined output is fed into a low frequency amplifier.

3,653,352

HULL FORM OF A SHIP PROVIDED WITH A CYLINDRICAL BOW

Takeshi Tomiyama, and Masanobu Sudow, both of Tokyo, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed May 13, 1970, Ser. No. 36,839

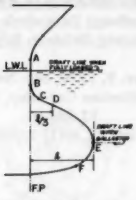
Claims priority, application Japan, May 16, 1969, 44/37589

Int. Cl. B63b *1/04*

U.S. Cl. 114—56 **9 Claims**

According to the invention the hull of the ship has at its bow a substantially cylindrical configuration at the full-load line and the configuration of a forwardly projecting fin at the ballast line. The upper portion of the forwardly projecting fin

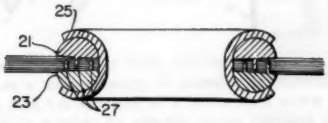
has the configuration of a convex ridge providing a transition between the cylindrical portion and forwardly projecting portion of the fin which is beyond the convex ridge configuration of the upper fin portion.



3,653,353
ATTACHMENT POINT

Harry T. Davis, West Peabody, Mass., assignor to Hood Sailmakers, Inc., Marblehead, Mass.

Filed Sept. 23, 1970, Ser. No. 74,773
Int. Cl. B63h *9/08*
U.S. Cl. 114—115 **2 Claims**

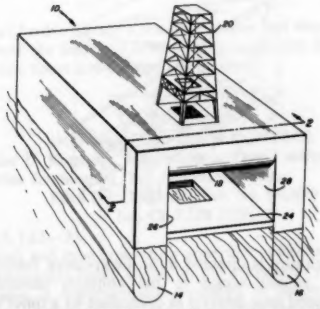


The attachment point disclosed herein is adapted for applying a substantial load to a fabric sheet. A particularly fitting example of an application for such an attachment point is at the clew of a sail such as a Genoa jib where, in a large sailboat, the jib sheet (a rope) may be holding the sail in position under a load of several hundreds to several thousands of pounds. The attachment point employs a pair of complementary ring members, each having a multiplicity of needle-like teeth. These ring members are clamped on opposite sides of a plurality of cloth layers by means of a metallic inner liner which is rimmed down over the ring members so as to apply a clamping force sufficient to prevent combing of the teeth through the cloth layers under a lateral pressure in the same order of magnitude as the strength of the cloth layers themselves.

3,653,354
CATAMARAN STABILIZER

Frans V. A. Pangalila, Matawan Township, N.J., assignor to Flume Stabilization Systems, Inc., Westwood, N.J.

Continuation-in-part of application Ser. No. 850,574, Aug. 15, 1969, now abandoned. This application Mar. 2, 1970, Ser. No. 15,798
Int. Cl. B63b *43/06, 35/00*
U.S. Cl. 114—125 **5 Claims**

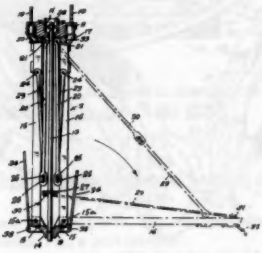


A free-surface stabilizing tank for a catamaran-like structure. The catamaran is defined by a pair of buoyant bodies lying side by side, joined together by a deck plate. The free-surface tank is defined by the two adjacent walls of the bodies and a bottom plate lying below the surface of the water and, like the deck plate, joining the two buoyant bodies. The bottom plate is positioned so as to be above the water level when the catamaran-like structure is in transit and so as to be below the water level when the structure is in its working position.

3,653,355
MUD ANCHOR

John A. Christians, Springfield, and Otis R. Pannell, Alexandria, both of Va., assignors to The United States of America as represented by the Secretary of the Army

Filed Aug. 6, 1970, Ser. No. 61,571
Int. Cl. B63b *21/28*
U.S. Cl. 114—206 A **8 Claims**

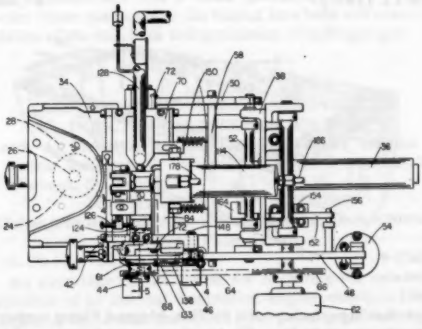


An explosive embedment anchor for use in mud bottoms which are too soft for efficient utilization of existing explosive embedment anchors. Anchors for this type are shot from a gun into the bed of a body of water, the anchor being the projectile. The anchor, after embedment, unfolds outward when pulled upward, much in the manner of an inverted umbrella. It consists of flukes hinged to a nose. The flukes are connected to a head by tie bars. A fabric attached to the flukes spreads out upon unfolding to hold it in the mud upon an upward pull of the head.

3,653,356
COATING MACHINE

Carl H. Brastow, Foxborough, Mass., assignor to Jacob S. Kamborian, West Newton, Mass.

Filed Sept. 2, 1970, Ser. No. 69,069
Int. Cl. B05c *11/00*
U.S. Cl. 118—7 **6 Claims**



A machine, that incorporates an applicating mechanism, for applying coating material to a portion of the vamp of a shoe upper to form a box toe. The applicating mechanism includes a roll rotatable within a housing between a pair of

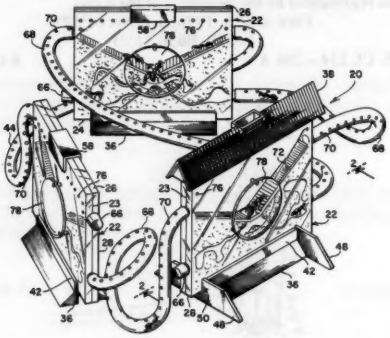
walls, the bottom of one of the walls constituting a scraper blade. The movement of the vamp beneath the applicating mechanism causes the roll to apply the coating material to the vamp to a thickness determined by the scraper blade.

3,653,357

ENTOMOLOGICAL OBSERVATION DEVICE

Stanley S. Sheidlower, 43 Burton Avenue, Woodmere, N.Y., and Elliot S. Glanz, 4005 Greentree Drive, Oceanside, N.Y.

Filed June 1, 1970, Ser. No. 41,917
Int. Cl. A01k *01/00*
U.S. Cl. 119—1 **5 Claims**



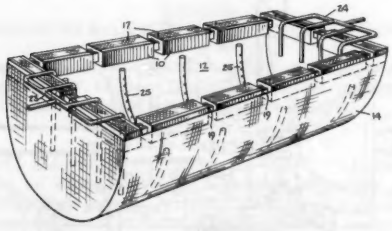
A device for entomological observation comprised of a modular enclosed structural unit having transparent walls and adapted to simulate therein the natural environment of the insects under study. The modular unit is further provided with openings in top and bottom walls for permitting interlocking engagement between several of the units for assembly or stacking thereof. Flexible transparent plastic tubing is used to interconnect the several units to allow the insects therein to traverse between the units. A magnifying lens is affixed to one of the transparent walls for enlarging any insects within the field of view.

3,653,358

FLOATING FISH GROWING TANK

Howard J. Fremont, New York, N.Y., assignor to Marine Protein Corporation, New York, N.Y.

Filed Apr. 6, 1970, Ser. No. 25,907
Int. Cl. A01k *63/00*
U.S. Cl. 119—3 **8 Claims**



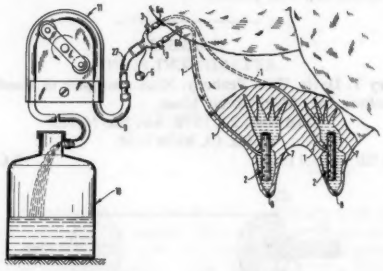
A floating growing tank for fish. Moored Floats support a closed watertight liner filled with water and immersed in a relatively large body of water. A protective mesh surrounds the liner. A plurality of such tanks can be grouped around a service platform to form a system.

3,653,359

METHOD AND APPARATUS FOR MILKING DAIRY ANIMALS BY MEANS OF A CATHETER

Adolf Tolle, Kiel-Kitzeberg, Drosseleck 4, and Hans Zeidler, Post Raisdorf, Schlesweg-Holstein, Schadtbeck, both of Germany

Filed Mar. 9, 1970, Ser. No. 17,696
Claims priority, application Germany, Mar. 12, 1969, P 19 12 585.0
Int. Cl. A01j *03/00*
U.S. Cl. 119—14.02 **24 Claims**



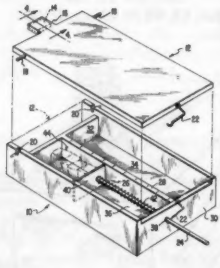
To provide for germ-free milk removal, a suction element, introduced into the udder of a dairy animal is connected to a catheter which is carried beneath the skin of the animal to a point conveniently accessible for germ-free connection of milking apparatus, such as, for example, near the knee of one of the legs of the animal. The suction element may be an open, perforated tube, ball-shaped or the like, and the catheter secured thereto. The exit wound is closed off by means of a collar or sleeve, which may be perforated to promote tissue regrowth and effective sealing of regrown skin.

3,653,360

ANIMAL FEEDER AND TIMING MECHANISM THEREFOR

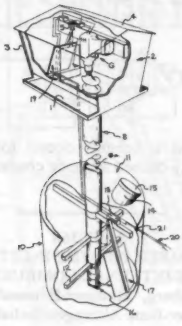
William C. Foster, 603 Bay Drive, Baltimore, Md.

Filed Jan. 19, 1970, Ser. No. 4,010
Int. Cl. A01k *5/02*
U.S. Cl. 119—51.12 **1 Claim**



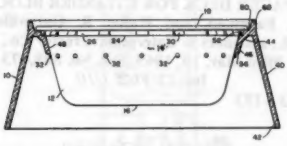
The disclosure is directed to an inexpensive feeder which will deny animal access to the contents thereof for a predetermined time interval as controlled by a timer employing ice as a meltable timer element.

3,653,361
AUTOMATIC SELF-FILLING BIRD FEEDER
Don Holliday, 10323 Sierra Dawn Drive, Sylvania, Ohio
Filed July 17, 1970, Ser. No. 55,892
Int. Cl. A01k *39/00*
U.S. Cl. 119—52 AF **1 Claim**



A feeding device for birds and the like in which a container has a large quantity of granular or pulverulent feed material which is elevated to a feeder by a screw conveyor operating in a tube. An electric motor operates the screw conveyor intermittently in response to a switch in the feeder, which is actuated by a pendulum-like arm swung by gravity when the feed supply is reduced or exhausted. A similar pendulum operated switch is in the container and is connected in the circuit with the other switch. It breaks the circuit when the supply of feed in the container is exhausted.

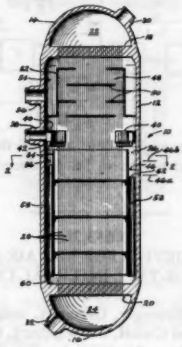
3,653,362
DISPOSABLE PET ANIMAL FEED CONTAINER AND HOLDER
Paul Davis, Swampscott, Mass., assignor to Sweetheart Plastics, Inc., Wilmington, Mass.
Filed Aug. 19, 1970, Ser. No. 65,166
Int. Cl. A01k *5/00*
U.S. Cl. 119—61 **10 Claims**



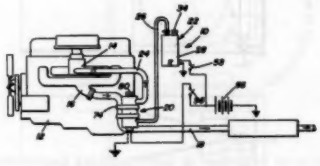
A pet feeder having a reusable holder and disposable liner with both the liner and holder being separately nestable with other like liners and holders when empty.

3,653,363
DOWNCOMER FLOW CONTROL
Nicholas D. Romanos, Chattanooga, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.
Filed Dec. 10, 1970, Ser. No. 96,680
Int. Cl. F22b *1/06*
U.S. Cl. 122—32 **10 Claims**

A shell and tube type vapor generator is disclosed in which the vaporizable liquid supply to the evaporator region of the apparatus is automatically regulated in response to load changes on the unit. The vapor generator incorporates a plurality of conduits arranged to conduct liquid from the downcomer reservoir to the evaporation region. The conduits are arranged in such a way that the number of conduits conducting liquid from the reservoir to the evaporator is variable according to the load demand on the unit.



3,653,364
COMBUSTION CONTROLLING ANTI-POLLUTION DEVICE
Simeon Bogan, Wilkes-Barre, Pa., assignor to Elizabeth P. Mensch, Dallas, Pa., a part interest
Filed Oct. 27, 1970, Ser. No. 84,421
Int. Cl. F02b *43/08*; **C01b** *1/08*
U.S. Cl. 123—3 **6 Claims**

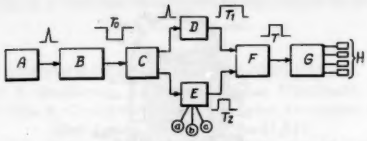


A device for producing hydrogen gas and introducing it into the intake manifold of an internal combustion engine with the device being in the form of a container having iron balls therein heated by an exhaust pipe from the engine, and electrically energized heating device with the container being in communication with a steam producing device whereby water vapor passing over the heated iron balls will cause oxidation of the iron balls and production of hydrogen gas.

3,653,365
ELECTRONIC CONTROL SYSTEM FOR THE INJECTORS OF INTERNAL ENGINES
Louis A. Monpetit, L'Etang-La-Ville, France, assignor to Societe des Procedes Moderness d'Injection Sopromi, Les Mureaux, France
Filed Mar. 5, 1970, Ser. No. 16,735
Claims priority, application France, Mar. 10, 1969, 6906642
Int. Cl. F02m *51/00*
U.S. Cl. 123—32 EA **9 Claims**

An electronic circuit system for triggering the successive injectors of an internal combustion engine, chiefly a Diesel engine. A first circuit controlled by the rotation of the engine provides for the starting of saw-tooth voltage wave, the length of the rising slope of which depends on the speed of rotation while the peals of said pulses trigger the injections which last until the end of the pulse. A delay for said trigger-

ing is advantageously obtained by the difference between the time constants of two flip-flops the first of which is constant while that of the second flip-flop depends on the operative



parameters of the engine, the end of the injection being defined by the end of the signal produced by the first flip-flop.

3,653,366

CONTROL DEVICE FOR THE AIR-INTAKE OF CARBURETOR-TYPE INTERNAL COMBUSTION ENGINES

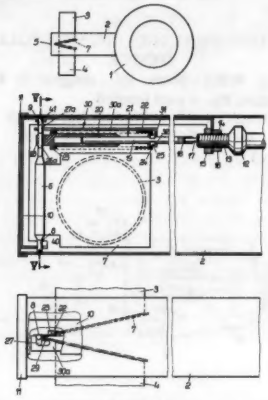
Richard Hoferer, Bissinger, Germany, assignor to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Germany

Filed Mar. 23, 1970, Ser. No. 21,876

Claims priority, application Germany, Apr. 2, 1969, P 19 16 864.0

Int. Cl. F02m *35/04*

U.S. Cl. 123—122 D **7 Claims**



An air intake control device admitting preheated and/or cold air to the carburetor in response to changes in the air temperature, the device having a thermostat-controlled control flap pivoting between the intake openings of a cold-air duct and a warm-air duct, closing off the one or the other in its end positions. The control linkage includes a telescopically compressible push linkage with an overload spring and a pushinsensitive pull member pulled by the overload spring in its retracting node and connected to the control flap shaft at a greater pivot arm than that of the push linkage, so that the overload spring serves also as the return spring for the control flap. The control members are mounted on a removable frame inside the main intake duct.

3,653,367

CONTACTLESS IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Kazuo Oishi, Kariya-shi, Japan, assignor to Nippondenso Kabushiki Kaisha

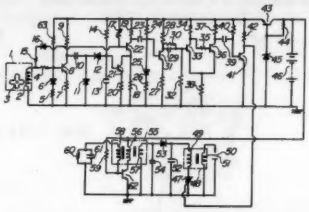
Filed Dec. 15, 1969, Ser. No. 884,803

Claims priority, application Japan, Dec. 18, 1968, 43/93368

Int. Cl. F02p *3/06*

U.S. Cl. 123—148 E **8 Claims**

A contactless ignition system for an internal combustion engine wherein the signal source comprises of a signal generator whose output signal voltage increases in proportion to an increase in the rotation speed of the engine, and the waveform of the output signal from said signal generator is changed by means of a level detector circuit such as a saturation amplifier and a Schmitt circuit for detecting signal levels, whereby any desired advance characteristics are easily attained.



3,653,368

VALVE CHAMBER FOR THE INLET VALVE OF A FOUR-CYCLE INTERNAL COMBUSTION ENGINE

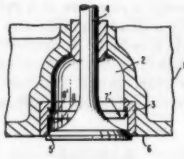
Hans O. Scherenberg, Stuttgart-Heumaden, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Dec. 12, 1969, Ser. No. 884,537

Claims priority, application Germany, Dec. 14, 1968, P 18 14 694.6

Int. Cl. F01l *3/00*

U.S. Cl. 123—188 S **9 Claims**



A valve chamber for the inlet valve of a four-cycle internal combustion engine in which the valve chamber is provided with at least one detaching step in proximity to the valve seat which forms a sharp edge pointing in the direction of the flow of the air to facilitate detachment of fuel precipitated along the walls.

3,653,369

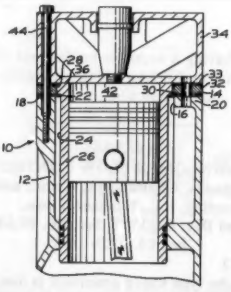
SPACER DECK FOR CYLINDER BLOCK

Charles N. Fangman, and Walter R. Gutzwiller, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 19, 1969, Ser. No. 808,473

Int. Cl. F02f *1/10*

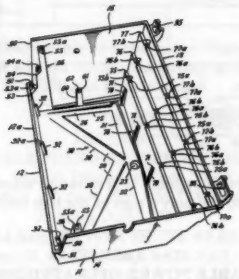
U.S. Cl. 123—193 **4 Claims**



A spacer deck for an engine cylinder block comprising two plates between the top deck of the cylinder block and the bottom deck of the cylinder head, the lower plate utilized as

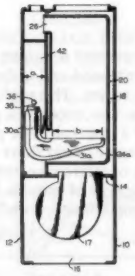
a resilient seating member for a cylinder liner flange while the upper plate serves as a spacer.

3,653,370
BARBECUE COOKER
Roger T. Shaper, and John E. Germann, both of Houston, Tex., assignors to Metal Window Products, Inc.
Filed Aug. 6, 1970, Ser. No. 61,762
Int. Cl. A47j *37/00;* **F24b** *3/00*
U.S. Cl. 126—25 A **3 Claims**



The specification discloses an outdoor barbecue cooker having a housing with means in the housing for supporting a cooking grill at various elevations above the heat source whereby the distance between the heat source and the food being cooked can be adjusted as desired. The means for supporting the grill at various elevations includes a plurality of steps or vertically spaced ledges formed in the rear of the housing and a plurality of recesses formed in the front corners of the housing for supporting the grill.

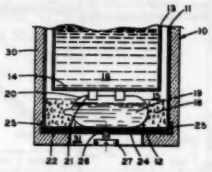
3,653,371
HOT AIR FURNACE HAVING L-SHAPED BURNERS
Herbert C. McManus, Elyria, Ohio, assignor to American Standard Inc., New York, N.Y.
Filed Oct. 29, 1970, Ser. No. 84,967
Int. Cl. F24h *3/00, 9/18*
U.S. Cl. 126—91 R **7 Claims**



A hot air furnace having special L-shaped gas burners extending partially into heat exchanger shells. The fuel-air mixing portions of the burners are located outside the shells in a narrow compartment such that the total depth of the furnace can be somewhat less than under conventional practice.

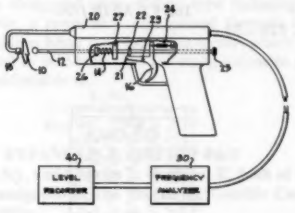
3,653,372
CHEMICALLY HEATED CONTAINER
Beverly Douglas, 423 Sunnyside Drive, Nashville, Tenn.
Filed Dec. 12, 1969, Ser. No. 884,515
Int. Cl. A47g *23/04;* **F24j** *1/00*
U.S. Cl. 126—263 **7 Claims**

A chemically heated stove having a heating chamber containing a solid chemical reactant and a frangible capsule containing another chemical reactant, and a pressure actuator member, such as a lever or thumb-screw, mounted on the container for breaking the capsule upon the application of pressure to cause the chemical reactants to mix in an exothermic reaction.



In a preferred form of the invention, the stove is made integral with the bottom of a comestible container, and the walls are insulated, not only to make the heating of the comestible more efficient, but to protect the hand of the person holding the container.

3,653,373
APPARATUS FOR ACOUSTICALLY DETERMINING PERIODONTAL HEALTH
Steven C. Batterman, 109 Charlann Circle, Cherry Hill, N.J.
Filed Jan. 19, 1970, Ser. No. 3,938
Int. Cl. A61b *5/00*
U.S. Cl. 128—2 K **7 Claims**

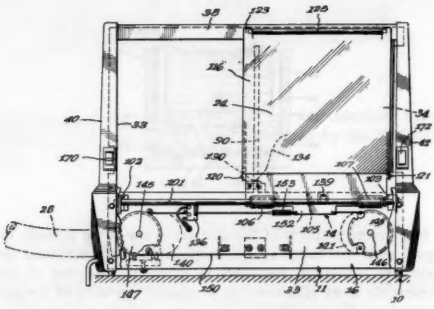


A pre-determined exciting force is imparted to a patient's teeth to cause them to emit a measurable sound or radiation response. The response is picked up by a microphone located inside the oral cavity immediately behind the teeth, and then is conveyed to a frequency analyzer positioned near the patient. Optionally, a sound level recorder can be connected to the frequency analyzer so as to automatically record the sound spectra on preprinted recording paper. Since the emitted sound is a function of the frequency response of the teeth, which in turn depends upon the rheology and hence the health of the periodontium or teeth supporting structures, periodic checks of the teeth's frequency response can provide a record of the changes in the patient's periodontal health.

3,653,374
SPIROMETER
Daniel A. Talonn, University City, and Marvin D. Stumpf, St. Louis, both of Mo., assignors to Sherwood Medical Industries Inc.
Filed Dec. 17, 1969, Ser. No. 885,758
Int. Cl. A61b *5/08*
U.S. Cl. 128—2.08 **17 Claims**

A spirometer of the bellows type having a frame that releasably holds a pivotal bellows assembly carrying a vertically movable stylus that impresses a tracing on a spirogram record carried by a translating carriage assembly adjacent the stylus, with the spirogram being traced on one side of a pressure sensitive record permitting viewing of the tracing from

the other side as it is being recorded. Ease of removal of the bellows permits rapid cleaning of the bellows while the pivoted bellows mounting permits use of a curved recording

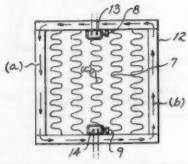


surface resulting in use of a linear chart. The chart is readily insertable into a self-centering chart holder which accurately aligns the chart ready for receiving a spirogram record.

3,653,375
MASSAGING CHAIR

Marvin J. Raffel, 135 W. Indian Creek Court, Milwaukee, Wis.

Filed Oct. 30, 1970, Ser. No. 85,598
Int. Cl. A61h 1/00
U.S. Cl. 128—33 **11 Claims**



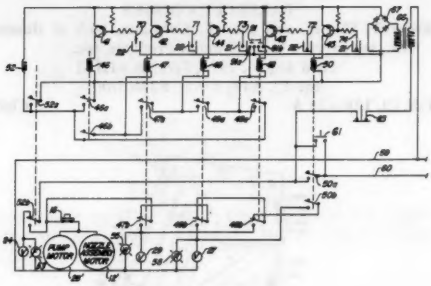
Two vibrators are mounted on opposite sides of a chair frame below the seat so that the path lengths of the waves traveling through the chair from the vibrators are equal in both directions in a closed path. There are two controls for the vibrator motors, one control regulating the amount of massaging action by controlling the speed of both the vibrators, while the other control regulates the speed and direction of massaging action by controlling the differential speed between the two vibrator motors.

3,653,376
METHOD AND APPARATUS FOR CONTROLLING AUTOMATIC SHAMPOO MACHINE

Wendell L. Martin, 2815 Kersdale Road, Pepper Pike, Ohio

Filed May 25, 1970, Ser. No. 40,198
Int. Cl. A61h 9/00
U.S. Cl. 128—66 **12 Claims**

Apparatus and method for applying hair treating solutions to hair on the human head. Measured amounts of water are collected in individual tanks and pumped through valves to an oscillating nozzle assembly which directs jets of liquid solutions at the hair. Additives are mixed with the water while in the containers or in the valves. Probes detect the levels of liquid in the tanks and control switches which actuate and release the valves in sequence according to the levels of liquid in the tanks to allow a measured amount of one solution and then another to be supplied to the nozzle assembly. The sequence is repeated until a desired amount of

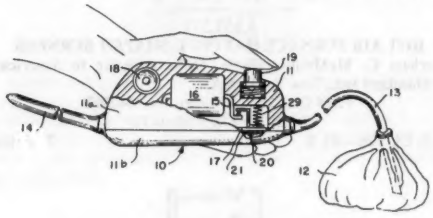


solution has been applied. A rest switch allows the apparatus to operate through only a part of the hair treating process.

3,653,377
PORTABLE POWER-OPERATED DOUCHING APPLIANCE

Jerome I. Rebold, Timonium, Md., assignor to Leonard Bloom, Baltimore, Md., a part interest

Continuation-in-part of application Ser. No. 681,364, Nov. 8, 1967, now abandoned. This application Oct. 1, 1970, Ser. No. 77,114
Int. Cl. A61h 9/00
U.S. Cl. 128—66 **12 Claims**



A portable power-operated douching apparatus is intended to be held in the user's hand and is furnished with a nozzle for insertion into the vagina. The appliance is compact, battery operated, and has a motor-driven pump for drawing the douching fluid out of a reservoir. The pump is of the oscillatory type, and the douching fluid flows out of the nozzle into the vagina in a series of interconnected fluid pulses, thereby developing a pulsating flow of variable intensity, and thereby improving the cleansing efficiency while providing a refreshing stimulation.

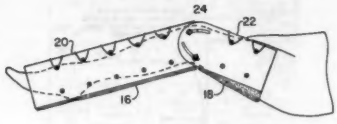
3,653,378
ADJUSTABLE SPLINT

Karl A. A. Reuther, 3070 Silver Lake Boulevard, Cuyahoga Falls, Ohio

Filed May 6, 1970, Ser. No. 35,170
Int. Cl. A61f 5/04
U.S. Cl. 128—88 **7 Claims**

A splint which may be easily adjusted to the angle of the knee or elbow of a broken leg or arm and which may be easily applied to the broken limb to hold the limb and the joint in position. The splint has a pair of side members which are joined together along one edge by canvas panels and along the opposite edge by removable lacings. The adjacent faces of the side members are covered with heavy padding. Each of the side members is formed of a pair of boards, the first

board being rectangular and the second, shorter board partially overlapping the first board. A pair of bolts extending through slots in the second board permit the angle between



the first and second boards to be adjusted. The canvas panel may be provided with an opening to permit access to the injured limb after the splint has been installed.

3,653,379

ADJUSTABLE PRESSURE IPPB VENTILATOR

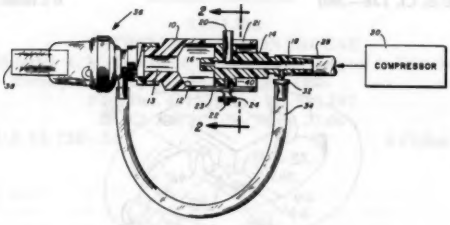
Joseph G. Glenn, 1523 S. Delaware Place, Tulsa, Okla.

Continuation-in-part of Ser. No. 736,173, June 11, 1968, Pat. No. 3,581,742

Filed Aug. 20, 1970, Ser. No. 65,602

Int. Cl. A61m *15/00;* **A62b** *7/02*

U.S. Cl. 128—145.6 **8 Claims**



A breathing apparatus in which gas is delivered to a patient under pressure intermittently. Air or oxygen delivered into a venturi tube includes an adjustable nozzle for changing pressure as required for a particular patient's demand.

3,653,380

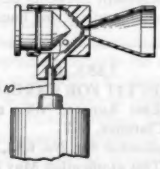
AEROSOL POWDER DOSAGE DISPENSING DEVICE

Lloyd Frank Hansen, Campbell Hall, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed Feb. 16, 1970, Ser. No. 11,555

Int. Cl. A61m *13/00, 11/00;* **A61l** *13/00*

U.S. Cl. 128—266 **2 Claims**



A dispensing device is described with a mixing chamber in which a dose of powder or other medicament is introduced through an outlet for a human body cavity, such as a mouthpiece or a hollow projection suitable for inserting in a nostril. A source of gas under pressure, for example from an aerosol can, is introduced into the chamber at an angle, and there is present in the chamber a larger movable element, such as a steel ball, which vibrates and breaks up the particles or aggregates. In one modification a half capsule containing the dosage may be introduced into the chamber and the capsule after emptying itself constitutes the moving element.

3,653,381

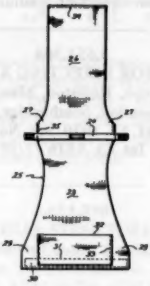
BELTED DIAPERS

Crystal E. Warnken, 4119 Big Meadows, San Antonio, Tex.

Filed Mar. 23, 1970, Ser. No. 21,764

Int. Cl. A61f *13/16*

U.S. Cl. 128—284 **8 Claims**



A belted diaper comprising a washable fabric of desired shape with an elongated strip of loop type fastening means secured thereto; a removable belt passed through folds of said fabric includes hook type fastening means which are adjustably secured tc said loop type fastening means to provide a snug and comfortable fit.

3,653,382

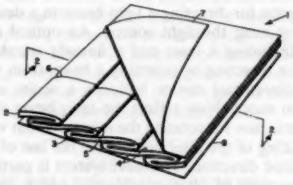
EXPANDABLE AIRFELT PAD

Charles E. Easley, and Charles L. Wosaba, II, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 22, 1969, Ser. No. 886,878

Int. Cl. A61f *13/16*

U.S. Cl. 128—284 **8 Claims**



A composite pad composed of a topsheet and a bottom sheet with an absorbent, folded planar airfelt pad disposed therebetween. The absorbent, folded planar airfelt pad consists of a glabrous surfaced and folded airfelt composed of less than textile length fibers such as wood pulp fibers and intended for use as an absorbent layer in disposable articles, for example disposable diapers having a topsheet, an absorbent layer, and a relatively water impermeable backsheet. The glabrous surfaced and folded airfelt provides interface slippage between substantially horizontal folds thereby avoiding tensile stresses and preventing in use rupture failure of the absorbent layer in the disposable articles, while contributing to toilet flushing disposal and absorbency.

3,653,383

ALGIN SPONGE AND PROCESS THEREFOR

Raymond G. Wise, Evansville, Ind., assignor to Freeze Dry Products Inc., Evansville, Ind.

Filed July 30, 1969, Ser. No. 846,276
Int. Cl. A61f 13/00
U.S. Cl. 128—296 7 Claims

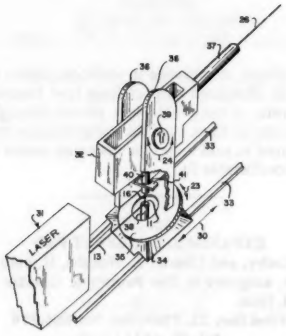
Water-absorbent and water-disintegrative open-celled porous algin sponges are provided, which sponges may be used as medical receptors for biological fluids. The process for making the water-absorbent and water-disintegrative algin sponge includes freezing an algin dispersion, such as a gel of sodium alginate and calcium alginate, and thereafter sublimating the frozen dispersion medium.

3,653,384

APPARATUS FOR DIRECTING A LIGHT BEAM

Charles Hermas Swope, Holliston, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Oct. 13, 1970, Ser. No. 80,290
Int. Cl. A61b 17/36
U.S. Cl. 128—303.1 9 Claims



Apparatus for directing a light beam in a desired direction without moving the light source. An optical system is disclosed, including a laser and a linearly translatable optical device for directing or orienting a beam from the laser. The optical directional device includes a series of mirrors arranged to successively reflect the laser beam and further includes structure for rotating the mirrors about various axes to allow exiting of the laser beam from the last of these mirrors in a desired direction. The laser system is particularly useful in the process of photocoagulation and is useful in other medical and optical applications as well.

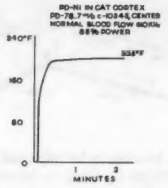
3,653,385

PRODUCTION OF FOCAL BRAIN LESIONS BY INDUCTIVE HEATING

Charles Burton, 1718 Sylvan Lane, Gladwyn, Pa.

Filed Oct. 20, 1970, Ser. No. 82,366
Int. Cl. A61b 17/36; A61n 3/00
U.S. Cl. 128—303.17 4 Claims

A metallic pellet or seed is physically implanted into the brain in a position where a brain lesion is to be produced. The seed is composed of a metallic alloy of predetermined composition capable of being inductively heated by radio frequency energy. By virtue of the composition of the alloy, the seed reaches but does not exceed a predetermined temperature, and the desired size and degree of lesion is controlled as a function of time during which the radio frequency field is in operation.

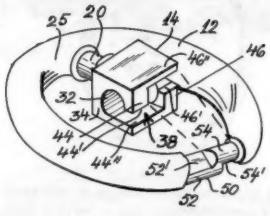


3,653,386

PACIFIER AND SAFETY TEETHING RING ASSEMBLY

Rodman M. Jacobus, 67 Rosedale Road, Valley Stream, N.Y.

Filed Feb. 11, 1970, Ser. No. 10,468
Int. Cl. A61j 17/00
U.S. Cl. 128—360 6 Claims



A pacifier and teething ring assembly includes a solid, endless ring handle, a fitting rotatably engaged on a section of the handle, a nipple on a stud extending from the block and a disc on the nipple. The length of stud and nipple, and the diameter of the disc both exceed the diameter of the inside opening of the ring handle so the fitting cannot be positioned inside the opening. The fitting has a cylindrical bore with lateral irregularly shaped slot to fit on the irregularly shaped section of the handle only by lateral movement of the fitting when inside the handle opening with nipple and disc detached. This arrangement prevents accidental removal of the fitting from the solid, endless ring handle.

3,653,387

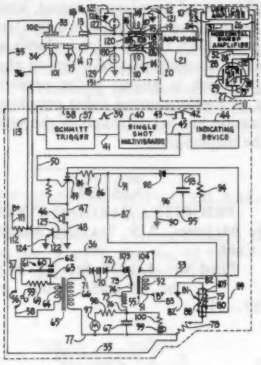
PROTECTOR CIRCUIT FOR CARDIAC APPARATUS

Richard R. Ceier, East Aurora, N.Y., assignor to Cardiac Electronics, Inc., Clarence, N.Y.

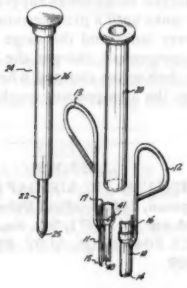
Continuation of application Ser. No. 653,201, July 13, 1967, now abandoned. This application May 8, 1970, Ser. No. 33,172
Int. Cl. A61b 5/04
U.S. Cl. 128—2.06 R 3 Claims

A protector circuit having relay arrangement and gas discharge tubes coupled between first electrodes attached to a patient and the amplifier of an electrocardiograph, the relays comprising fast acting reed relays which break the circuit when a defibrillator is energized to apply a countershock voltage across second electrodes mounted on said patient, to prevent the countershock voltage from distorting the heart-

beat waveform produced by the electrocardiograph. The gas discharge tubes prevent voltages in excess of a predetermined value from reaching the amplifier by conducting such voltages to ground, whether the relays are opened or closed.



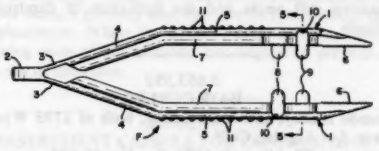
3,653,388
CATHETER INSERTION TROCAR
Heinrich A. M. Tenckhoff, Seattle, Wash., assignor to Battelle Development Corporation, Columbus, Ohio
Filed Dec. 4, 1969, Ser. No. 882,107
Int. Cl. A61b *17/34;* **A61m** *27/00*
U.S. Cl. 128—347 **4 Claims**



A trocar for insertion of catheters into a body wall is described. The trocar comprises a bivalved type tapered tip with a handle attached to each portion of the tapered tip, a tubular member adapted to encircle the rearward portion of the tapered tip and a stylet which is adapted to fit inside both the tubular member and the bivalved tapered tip. This device permits insertion of a flexible tubing catheter into a body member wall for prolonged intermittent access to a cavity beyond the body wall. This device is particularly useful in insertion of cuffed catheters into the abdominal wall.

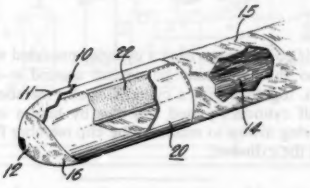
3,653,389
DISPOSABLE FORCEPS
Suel Grant Shannon, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Jan. 19, 1970, Ser. No. 3,682
Int. Cl. A61b *17/30;* **B25b** *1/02*
U.S. Cl. 128—354 **6 Claims**

Disposable forceps are molded from a suitable sterilizable plastic material and they have a pair of arms joined together at inner ends by a hinge section of reduced cross-section so that outer sections of the arms are disposed substantially parallel to each other when the arms are in their normally inoperative position. When the arms are operated, the outer ends of the teeth engage before or simultaneously with the engagement of the innermost ends of the strengthening ribs.



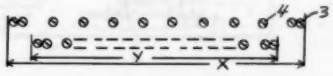
Alignment lugs are provided on an inside surface of each arm which have mateable surfaces to prevent any transverse misalignment between the teeth during engagement therebetween and outer ends of the alignment lugs engage recesses in the inside surfaces of the arms to prevent overstressing and rocking of the teeth.

3,653,390
CIGAR STRUCTURE
William G. Louden, Bucks County, Erwinna, Pa.
Filed Mar. 17, 1970, Ser. No. 20,260
Int. Cl. A24d *01/04;* **A24f** *07/00*
U.S. Cl. 131—11 **7 Claims**



A cigar having a tobacco filler, a binder surrounding the filler and a wrapper overlying the binder, is provided with a sheet of extensible material intermediate the filler and the wrapper in the head of the cigar forwardly of its tip. The extensible sheet stretches when the head of the cigar is engaged by the teeth of a smoker thereby to reduce stress on the binder and wrapper at the cigar tip caused by the normal tendency of the filler tobacco to be displaced rearwardly into the cigar tip during the smoking process. In the present instance, the extensible material is preferably lightweight paper having a stretch of about 4–20 percent, preferably 6–12 percent, and being wrapped around the filler or binder and underlying the wrapper in the head of the cigar to dispose the stretch properties circumferentially therearound.

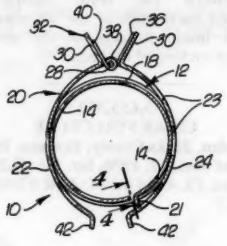
3,653,391
HAIR ROLLERS OR HAIR CURLERS
Ann Andrews, and Peter Andrews, both of 190 Gebhardt Road, Penfield, N.Y.
Filed Feb. 15, 1965, Ser. No. 432,576
Int. Cl. A45d *2/00*
U.S. Cl. 132—40 **15 Claims**



A cushion padded hair roller means which is coaxially bendable and resilient but yet having at least one portion thereof diametrically substantially rigid for use by persons in the hair roller do-it-yourself art whereby a chic look may be

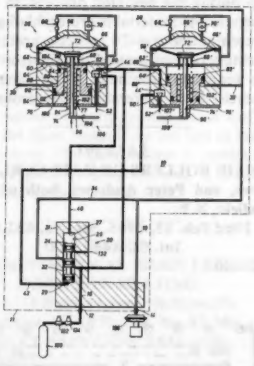
obtained even when traveling as well as when going out and, the persons, when substantially sleeping on some of the hair roller means which are dressed in their hair will still substantially receive sleeping comfort as well as protection for at least one portion of their scalp which is generally protected from becoming hair roller numb; deficient or unhealthy and thereby leading to loss of hair or balding; and at times preventing stiff necks and the formation of dandruff, accordingly.

3,653,392
HAIR CURLER
Armando Hassey, and Gina Hassey, both of 2795 Wynwood Lane, Los Angeles, Calif.
Filed Sept. 1, 1970, Ser. No. 68,639
Int. Cl. A45d *2/26*
U.S. Cl. 132—41 **4 Claims**



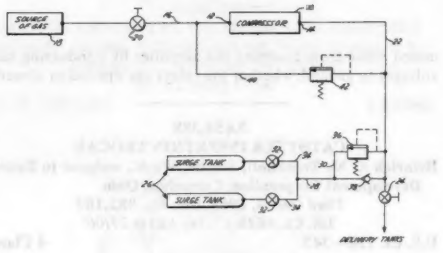
A hair curler comprising a cylinder provided with a row of teeth so that hair may be wound around it and secured thereon, together with a cylindrical clip member formed by two half cylinders joined together by hinges and provided with spring means to maintain the clip member fitting closely around the cylinder.

3,653,393
TIMING VALVES AND FLUID CONTROLLERS
Addison N. Love, Houston, Tex., assignor to Harold Brown Company
Filed May 5, 1969, Ser. No. 821,745
Int. Cl. F16k *31/12*
U.S. Cl. 137—102 **10 Claims**



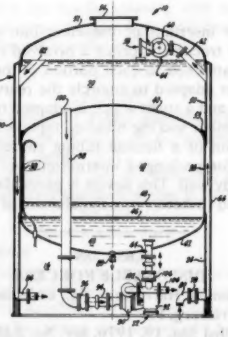
This invention relates to timing valves and to controllers using such timing valves for controlling the pressure fluid between a supply line and a utilization line servicing one or more pressure utilization devices with pressure signals of adjustable duration and frequency. The operation of a pair of complementary timing valves in the controller is synchronized by the pressure signals applied to the utilization line. One timing valve begins its predetermined delay period on the application of the pressure signal, while the other timing valve begins its delay period on the termination of the pressure signal. Each timing valve includes a time-calibrated variable orifice forming part of a timing chamber which includes fluid which is placed under pressure by a flexible diaphragm. A master control valve coupling the supply line to the utilization line is controlled by the successive displacements of the diaphragms.

3,653,394
PRIORITY CHARGING SYSTEM
Robert W. McJones, 529 Via Del Monte, Palos Verdes Estates, Calif.
Filed Nov. 4, 1970, Ser. No. 86,843
Int. Cl. G05d *11/00*
U.S. Cl. 137—114 **3 Claims**



Previously charged surge tanks supply the initial charging gas for delivery tanks until a predetermined pressure between gas in the delivery tanks and the surge tanks is reached, at which point a compressor charges the delivery tanks. The surge tanks are themselves charged when the pressure in an outlet line from the compressor reaches a predetermined value.

3,653,395
PACKAGE PNEUMATIC AIR-GAP PUMP STATION
William E. Chapman, 266 Deerfield Drive, Moraga, Calif.
Filed Apr. 21, 1971, Ser. No. 136,068
Int. Cl. F04b *19/06, 13/02;* **F04d** *31/00*
U.S. Cl. 137—209 **12 Claims**

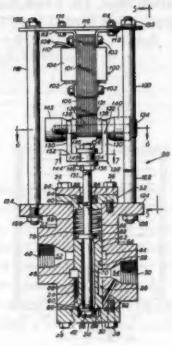


A pneumatic pump station for supplying water under pressure in water systems incorporating an air-gap feature to

preclude back flow and water source contamination. The pump station provides a compact, easily transportable unit including a hydro-pneumatic tank, holding tank and equipment compartment arranged in a housing with a plurality of vertically extending ribs forming either an inlet channel, overflow channel or drain channel and the like. An altitude valve in the holding tank discharges inlet water on a demand basis through an air-gap defined above the water level in the holding tank. Pump means in the equipment compartment pumps water from the holding tank through a supply column extending through the pneumatic tank and delivers it into either the pneumatic tank or to the end use system.

3,653,396
CONVERTIBLE SOLENOID-ACTUATED, BALANCED SPOOL VALVE

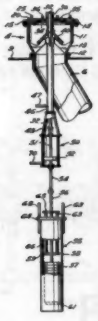
Henry H. Logan, 6107 Newburg Avenue, Chicago, Ill.
Filed Dec. 7, 1970, Ser. No. 95,713
Int. Cl. F16k *3/24*
U.S. Cl. 137—270 **12 Claims**



A solenoid-actuated spool valve which can be converted from normally-open to normally-closed condition by removing a single access closure and reversing the valve spool.

3,653,397
VALVE APPARATUS

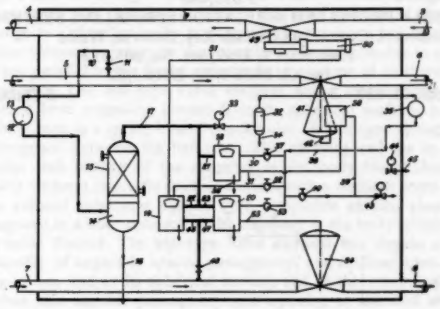
Tage Werner, Rocky River, Ohio, assignor to Arthur G. McKee & Company, Cleveland, Ohio
Filed Dec. 9, 1970, Ser. No. 96,477
Int. Cl. F16k *43/00*
U.S. Cl. 137—315 **20 Claims**



Bleeder valve apparatus for blast furnaces are disclosed in which valve parts subject to wear or erosion by abrasive-laden gas are readily accessible from the top of the apparatus for replacement or repair, without the necessity of removing supporting levers or other parts that impair access from the top. The valve members are supported and actuated from below to leave the tops of the valve members accessible. The valve apparatus, which may be either of the outer opening type or inner opening type, also comprises a movable valve member having two seats and a cooperating stationary member or body having two seats, one of the seats of each member being a primary seat that can be removed for repair or replacement. When the primary seats are removed, the remaining seats of the members can engage to prevent flow of gas out of the valve.

3,653,398
INSTRUMENT CAPSULE FOR CONTROL OF A SUBMARINE PETROLEUM INSTALLATION

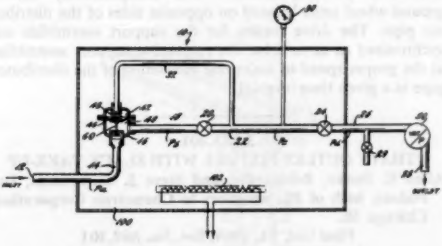
Pierre P. Orieux, Paris, France, assignor to Compagnie Francaise Des Petroles, Paris, France
Filed Oct. 9, 1969, Ser. No. 864,997
Claims priority, application France, Oct. 9, 1968, 169240
Int. Cl. F16k *49/00*
U.S. Cl. 137—334 **9 Claims**



A fluid proof container houses a number of Bourdon tube pressure gauges which govern the fluid pressure of a control fluid for setting the flow rates of various fluid conduits. A bleed line removes a portion of the gas in the controlled fluid conduits. The gas is passed through a series of heating, pressure reduction and drying to eventually supply both the inert atmosphere in the container and serve as the control fluid.

3,653,399
GAS FLOW CONTROLLING SYSTEM

Dale I. Steele, Silver Spring, Md., assignor to National Instrument Laboratories, Inc., Rockville, Md.
Filed June 15, 1970, Ser. No. 45,965
Int. Cl. F16k *49/00*
U.S. Cl. 137—334 **6 Claims**



The present invention relates to an arrangement for controlling the mass rate of flow of a particular gas to a predeter-

mined level and to a high degree of accuracy. The arrangement is particularly adapted to form part of a gas sampler arrangement. The errors of the prior art gas sampling techniques attributable to changes in temperature, barometric pressure, flow resistance, and pump efficiency are obviated. The arrangement is also well adapted to control the mass flow rate of compressed gases.

The arrangement is a three valve system through which the gas flows. The first valve is a pressure regulator valve controlled by the downstream pressure drop through the second valve and set to increase or reduce gas flow as needed to maintain the pressure drop across the second valve constant. The third valve which is downstream of the regulator and the second valve is set to operate under critical pressure ratio conditions. The flowing gas is then exhausted from the system, usually by operation of a vacuum pump or by discharge to the atmosphere.

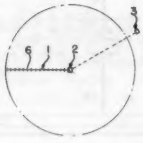
If the three valve arrangement is maintained in a thermostatically controlled, heated enclosure, the gas flows through the three valve arrangement at a constant mass rate, regardless of changes in flow resistances, pump efficiency temperature and barometric pressure of gas entering the system.

3,653,400

SELF-PROPELLED IRRIGATION SPRINKLING SYSTEM

Robert N. Coates, 108 Cascade Key, Bellevue, Wash.

Filed Mar. 7, 1969, Ser. No. 805,312
Int. Cl. B05b *9/02;* **E01h** *3/02*
U.S. Cl. 137—344 **3 Claims**



A self-propelled irrigation apparatus wherein a rigid water-distributor pipe is revolved about one of its ends as a pivot which also provides a connection to the water source, the distributor pipe being conveyed over the ground to be sprayed by individual electric motor-powered mobile supports. The pipe sections between mobile supports are strengthened by trussing with cables located beneath the level of the pipe and the individual motors driving the multiple support assemblies are controlled in response to horizontal flexing of the distributor pipe due to lagging or advancing of any one of the support assemblies relative to the others. Each support assembly constitutes a rigid A-frame structure with two pivotally-mounted and independently driven ground-wheel units located on opposite sides of the distributor pipe. The drive means for the support assemblies are sychronized so as to drive the respective support assemblies at the proper speed to make one revolution of the distributor pipe in a given time interval.

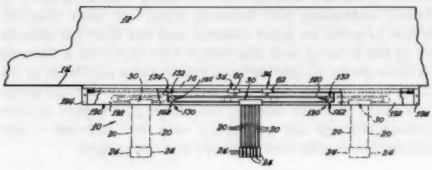
3,653,401

UTILITY OUTLET FIXTURE WITH SLACK TAKE-UP

Allan E. Beeler, Bensenville, and Steve J. Skowronski, Des Plaines, both of Ill., assignors to Chemetron Corporation, Chicago, Ill.

Filed Oct. 24, 1969, Ser. No. 869,301
Int. Cl. H02g *11/06;* **B65h** *75/46, 75/48*
U.S. Cl. 137—355.17 **15 Claims**

A utility outlet fixture, which provides utility access at any position within a predetermined range of positions, is characterized by means for removing slack in elongated flexible utility conduits which are connected at opposite ends respectively to a fixed receptacle and to a carriage movable along a track.

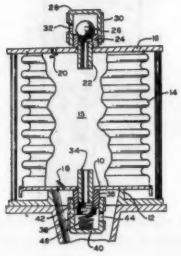


3,653,402

PRESSURE RESPONSIVE VALVE

Evald Dunkelis, Glen Ellyn, Ill., assignor to GPE Controls, Inc., Morton Grove, Ill.

Original application Sept. 16, 1968, Ser. No. 760,020.
Divided and this application Sept. 15, 1970, Ser. No. 72,272
Int. Cl. F16k *17/19*
U.S. Cl. 137—493 **5 Claims**



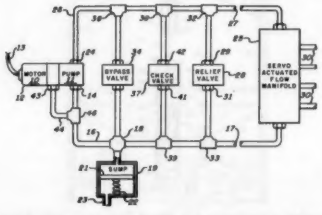
A pressure responsive valve having a single tank opening and single main pallet which provides pilot operation to relieve either overpressure or vacuum conditions within the tank. A pressure responsive pilot valve includes a pallet movable relative a seat, wherein the pallet is arranged within a housing and biased toward seated position, and adjustable aperture means is provided in the housing to regulate the volume-rate of gas flow past the pallet and through the valve.

3,653,403

ELECTRO HYDRAULIC CONTROL SOURCE FOR SUBMERSIBLE VEHICLE

Robert Halsey Pettit, Huntington, N.Y., assignor to Sperry Rand Corporation

Filed Feb. 9, 1970, Ser. No. 9,757
Int. Cl. E03b *5/00*
U.S. Cl. 137—565 **9 Claims**



An electro hydraulic system adapted for mounting on a submersible vehicle to supply high pressure fluid flow for

controlling the vehicle and various components affixed thereto. The system includes a hydraulic pump driven by a motor energized from a surface vessel, the fluid pressure at the pump output being regulated by a relief valve which has its low pressure port connected back to the return port of the pump. A preloaded sump tank coupled to the low pressure side of the relief valve operates to maintain the system fluid pressure in excess of the ambient water pressure independent of vehicle depth.

3,653,404

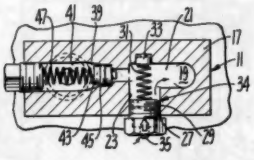
CUT-OFF VALVE

Charles D. Striplin, Box 515, Benica, Calif.

Filed July 14, 1970, Ser. No. 54,745

Int. Cl. F16k *15/02, 23/00*

U.S. Cl. 137—512.3 **2 Claims**



A cut-off valve is provided for use on a pressurized line wherein pressure is applied to the line at intervals to dispense a fluid from the line. The valve of the present invention is in the nature of a check valve with a piston arrangement whereby as pressure is released from the line, the valve causes a negative pressure on the outlet, sucking back the last few drops, preventing dripping. The valve is particularly applicable to dispensing a viscous fluid such as glue.

3,653,405

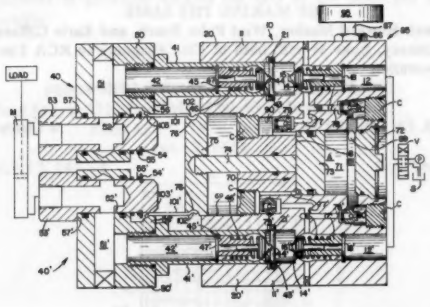
FLUID LINE COUPLER

Vaughn A. Nelson, Downers Grove, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Jan. 5, 1970, Ser. No. 755

Int. Cl. F16k *11/10*

U.S. Cl. 137—594 **16 Claims**



A fluid line coupling including a male element, a female element, and fluid motor means associated with one of said elements which is adapted to be engaged with said other coupling element for hydraulically interlocking said coupling elements to complete a fluid circuit upon actuation of the motor means.

3,653,406

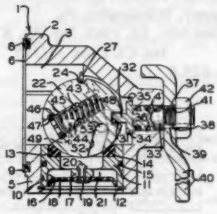
BRAKE CYLINDER PRESSURE RETAINING VALVE

Francis R. Racki, Pittsburgh, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Mar. 20, 1970, Ser. No. 21,429

Int. Cl. F16k *3/22*

U.S. Cl. 137—599.2 **9 Claims**



This invention relates to a three-position sealed ball-type brake cylinder pressure retaining valve device, for connection to the exhaust passageway of a railway car brake control valve device, having a body provided with a securing flange that has a port therein connecting the external face of the flange to a chamber in the body in which chamber a ball-type valve element is rotatably mounted by a handle movable in a plane parallel to the flange selectively to any one of its three positions. The ball-type valve element has a stepped bottomed bore extending inward from its spherical surface, in which bore is a spring-biased check valve. A leaf-type spring interposed between the ball-type valve element and the interior wall surface of the chamber in the body biases this valve element into tight seating contact with a resilient annular exhaust valve seat carried by a removable annular plug disposed in a bore connecting the chamber in the body to the exterior thereof. The ball-type valve element has therein a plurality of angularly spaced passageways and orifices opening at one end at its spherical surface and at the other end either into another passageway also opening at one end at this spherical surface or into the stepped bottom bore. These passageways and orifices, in cooperation with one another and with the check valve, are effective in three respective positions of the ball valve element to selectively provide a fast blow-down of brake cylinder pressure to atmosphere, a slow blow-down to a chosen pressure above atmospheric pressure, and a slow blow-down to atmosphere.

3,653,407

MIXING VALVE HAVING A SWIVEL SPOUT

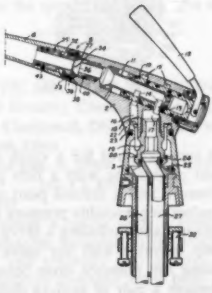
Ilmari Katva, Gelsted, Denmark, assignor to Broen Armatur I/S, Assens, Denmark

Filed Feb. 26, 1970, Ser. No. 14,586

Claims priority, application Denmark, Feb. 27, 1969, 1101/69

Int. Cl. F16l *27/00*

U.S. Cl. 137—615 **1 Claim**



A mixing valve, especially for hot and cold water and for use in connection with a kitchen sink, is constructed with a

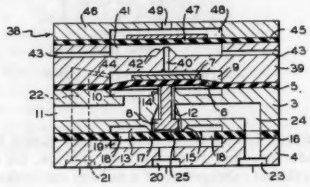
swivel spout which is articulated to permit rotation of the outer end of the spout about a horizontal axis perpendicular to the swivel axis.

3,653,408

DIAPHRAGM OPERATED LOGIC VALVES

Ronald W. Coiner, Irwin, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Nov. 24, 1969, Ser. No. 879,118
Int. Cl. F16k *31/385*
U.S. Cl. 137—625.6 **2 Claims**



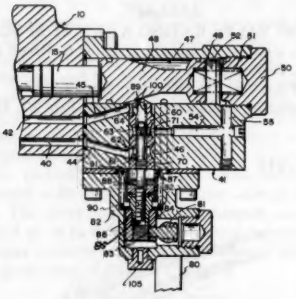
A diaphragm operated fluid logic valve device utilizing proportionate pressure areas on opposite sides of the diaphragms for obtaining differential pressures thereacross and, therefore, snap action during transition from one state to another, said valve device structurally including interface characteristics so as to be adaptable to a wide range of pressures and, therefore, directly applicable in a high pressure system without the use of a separate interface device, and being capable of integration with a variety of means, such as a low pressure fluidic signal, a small solenoid, or a Belleville spring to provide an interface function for piloting the control pressure functions of the valve device.

3,653,409

POWER ASSIST SERVO CONTROL FOR A VALVE

Edward O. Brannon, Racine, Wis., assignor to Rex Chainbelt Inc.

Filed Jan. 4, 1971, Ser. No. 103,385
Int. Cl. F16k *11/07*
U.S. Cl. 137—625.63 **10 Claims**



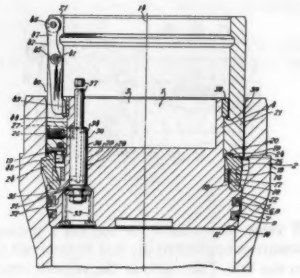
A power assist servo control for a valve wherein a valve spool has opposed pilot areas with a first pilot area acted upon by pilot pressure and a second pilot of larger area is acted upon by a selectively variable pressure of a lesser value than full pilot pressure and including a servo sleeve coacting with a servo ramp movable with the valve spool, a servo spool for controlling the pressure drop between pilot pressure and tank through a pair of orifices defined by a servo spool land and holes in the servo sleeve connecting to a passage leading to the second pilot area whereby an intermediate pressure between the two orifices is established to act upon the second pilot area, and means remotely operable for positioning the servo spool to vary the size of said two orifices relative to each other to resultingly change the pressure acting on the second pilot area and position the valve spool accordingly with the null point being reached by movement of the servo sleeve by the servo ramp to bring the two orifices back to an equal size.

3,653,410

PLUGS AND CLOSURES

Derek West, Dorset, England, assignor to Flight Refueling Limited, London, England

Filed Feb. 28, 1969, Ser. No. 803,338
Int. Cl. F16l *55/10*
U.S. Cl. 138—89 **11 Claims**



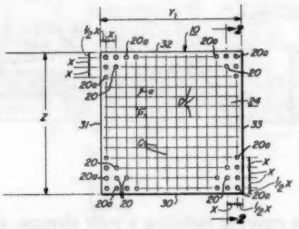
Cam-operated plugs or closures for use strut-like members the closing of openings in the fuel element stack pipes of atomic reactors. The plugs have a plurality of locking members mounted on the plug body, which locking members are pivotable by movement of a cam arrangement to a locking position in which they project beyond the periphery of the plug to engage the wall of the opening to prevent the plug from being withdrawn from the opening. The locking members comprise strut-like members which are arranged so that a force applied to the locking members by a tendency to withdraw the plug from the opening is a substantially compressive force.

3,653,411

CABLE HARNESS ASSEMBLY BOARD AND METHOD OF MAKING THE SAME

Frank Howard Mosher, West Palm Beach, and Earle Gifford Jenney, Lake Worth, both of Fla., assignors to RCA Corporation

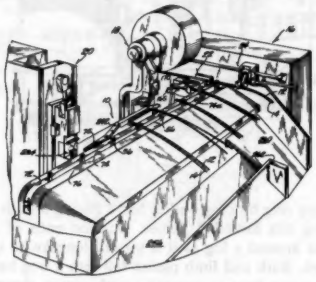
Filed Feb. 11, 1970, Ser. No. 10,374
Int. Cl. B21f *21/00*
U.S. Cl. 140—92.1 **4 Claims**



A harness cable assembly board includes one or more modular boards having pin receiving holes therein spaced in

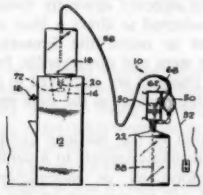
a predetermined grid pattern. Harness cable layouts for a plurality of different cable assembly configurations are detachably secured to the assembly board as are cable assembly guide pins which are removably inserted in the pin receiving holes. The same modular board may be used for a variety of different cable configurations and the layouts may be repetitively used with any of a plurality of modular boards.

3,653,412
CONVEYOR TRANSFER UNIT
Ragnar Gudmestad, West Allis, Wis., assignor to Artos Engineering Company, New Berlin, Wis.
Filed June 15, 1970, Ser. No. 46,391
Int. Cl. B21f *15/00*
U.S. Cl. 140—1 **29 Claims**



An apparatus for transferring a pair of parallel electric wire lengths from a measuring, cutting and stripping machine to a precise location with respect to a first terminal applicator and a second terminal applicator. The apparatus includes a pivotally mounted conveyor assembly in which the conveyor end closest to the cutting and stripping machine is movable in the vertical plane up into the path of the horizontal wire in the cutting and stripping machine, and down from said path a like amount. A plurality of wire length carrying clamps are mounted on the conveyor assembly for lateral movement between a pair of conveyor chains to predetermined positions with respect to the cutting machine and the applicators. A mechanical linkage is operatively connected to coordinate the pivotal movement of the conveyor assembly, the operation of the drive mechanism for the conveyor chains and the opening and closing of the clamps with the operation of the cutting and stripping machine. A wire length gatherer is provided around the end of the conveyor assembly.

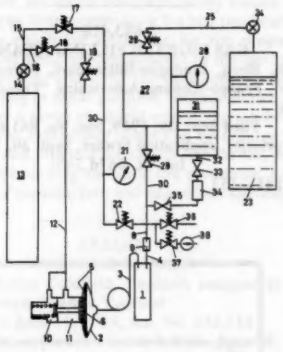
3,653,413
PUMP APPARATUS FOR BOTTLED WATER
Fred Sheya, 5312 Cartwright, North Hollywood, Calif.
Filed Apr. 2, 1970, Ser. No. 25,180
Int. Cl. B65b *1/16*
U.S. Cl. 141—1 **17 Claims**



The pump ap aratus is an economic and trouble-free apparatus for pumping drinking water from a source bottle positioned on the floor, where it is delivered, to an elevated vessel from which it can gravitationally flow. The apparatus comprises a centrifugal or other non-selfpriming pump which can be set directly on the mouth of the source bottle on the floor. A pump suction pipe extends into the source bottle. An elastomeric spheroidal squeeze bulb is serially connected to the pump, directly in its output line. Check valves are positioned on opposite sides of the squeeze bulb, with the suction check valve preferably on the input side of the pump. Manual squeezing of the bulb primes the pump. A flexible hose from the squeeze bulb discharges the water to the elevated bottle.

Since the elevated vessel has a filling opening in the top and a discharge opening in the bottom, means are provided to close the bottom opening during filling to prevent the water from running directly out. This is alternatively accomplished by means of a float valve or by means of a manually operated valve which is closed during the filling operation.

3,653,414
METHOD OF CHARGING A THERMOSTATIC SYSTEM WITH A CONDENSIBLE AND A NONCONDENSIBLE MEDIUM
Eric Weidner, Augustenborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark
Filed May 11, 1970, Ser. No. 36,312
Int. Cl. B65b *31/02*
U.S. Cl. 141—4 **1 Claim**

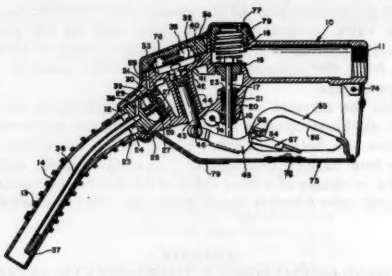


The invention relates to a method and apparatus for charging a thermostatic system with condensible and noncondensible mediums such as Freon and nitrogen. The noncondensible medium is introduced first at a predetermined partial pressure followed by the introduction of a measured quantity of the condensible medium. An aspect of the invention involves a preliminary flushing of the system with nitrogen at the system testing pressure such that not only is the system purged of air but the system is tested at the same time.

3,653,415
AUTOMATIC SHUT-OFF DISPENSING NOZZLE
William Donald Boudot; Chester W. Wood, and Charles A. Holder, all of Cincinnati, Ohio, assignors to Dover Corporation, Cincinnati, Ohio
Filed Dec. 4, 1969, Ser. No. 882,028
Int. Cl. B67d *5/375*
U.S. Cl. 141—208 **25 Claims**

Fluid flow through a nozzle body is controlled by a valve having a stem slidably mounted in the body. When a lever, which has one end pivotally and slidably connected to a plunger that is slidably mounted in the body and its other end pivotally connected to a handle, is moved by the handle, the

lever engages the bottom of the stem to open the valve. When a container, which is being filled by the nozzle, becomes filled, the plunger, which has been latched, is released so that a spring acting on the valve causes the stem,



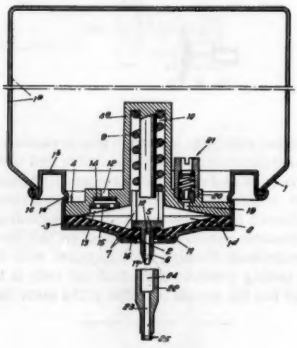
which has its lower end engaging the lever, to move the lever about its pivotal connection to the handle so that the valve moves to its closed position. The handle may be held in a valve open position by a trigger, which is pivotally connected to the handle at its pivotal connection to the lever.

3,653,416

GAS LIGHTER FILLING MEANS

Robert R. Hocq, Boulogne-Billancourt, France, assignor to Societe Franco-Hispano-Americaine Francispam, Paris, France

Filed Sept. 29, 1969, Ser. No. 861,673
Claims priority, application France, Sept. 30, 1968, 168157
Int. Cl. B67d *5/00*
U.S. Cl. 141—353 **9 Claims**



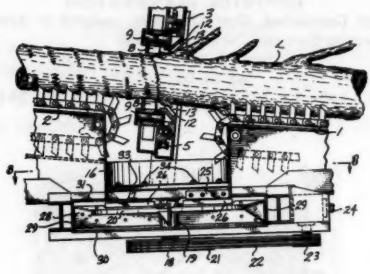
A gas bottle for filling gas lighters in which the gas bottle is provided with a pump for pumping the contents of a metering chamber in the bottle into a lighter being filled. The pump is arranged to be operated by a spigot projecting outside the lighter and which when moved opens a valve to allow the contents of the metering chamber to be expelled. The volume of the chamber is a fraction of the volume of the lighter being filled. The bottle is connected to the lighter by a detachable connection, and a cover is provided to protect the spigot and valve.

3,653,417

LOG BARKER DELIMBER AND REFUSE-REDUCING MECHANISM

Peter J. Cervenak, Seattle, Wash., assignor to Nicholson Manufacturing Company, Seattle, Wash.

Original application Mar. 30, 1967, Ser. No. 627,067, now Patent No. 3,536,265. Divided and this application Oct. 26, 1970, Ser. No. 84,056
Int. Cl. A01g *23/08*
U.S. Cl. 144—3 R **5 Claims**



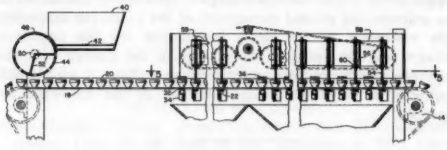
The rotary ring of a log barker has a flaring mouth carrying limb-cutting bits in radial planes. Hooked ends of swinging arms rotate around a log as it is moved lengthwise to scrape off the bark. Bark and limb pieces fall into a hog having stationary shearing bars cooperating with rotary shearing bars carried above a plate rotating about a vertical axis. Hogged material dropping through apertures in the plate is swept out of the casing by vanes carried by the rotor.

3,653,418

BRUSSELS SPROUTS TRIMMING MACHINE

Charles G. Oldershaw, Peter of Avon, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Filed Oct. 7, 1969, Ser. No. 864,396
Int. Cl. A23n *15/04*
U.S. Cl. 146—81 R **5 Claims**



A Brussels sprouts trimming machine comprises parallel endless chains provided with laterally disposed, horizontal conveyor flights each carrying pockets in the form of an inverted frustum of a right circular cone. A series of knives are provided beneath the bottom surface of the flights, ahead of which are nozzles directed upwardly toward each pocket. The nozzles are adapted to direct a blast of fluid upwardly into each pocket to orient the Brussels sprout therein properly, with its stem end downwardly, for cutting by the knives. Coacting plungers are employed to depress the Brussels sprouts into the pockets as the stem ends are presented to the knives.

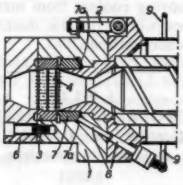
The feed section of the machine comprises means for feeding lines of Brussels sprouts to a continuously rotating drum with perforations or indentations whereby the Brussels sprouts will be retained on the periphery of the drum as they are directed thereto from the feeding means. The drum preferably rotates through 270° to deliver Brussels sprouts from the feeding means to the pockets on the

conveyor flights. The perforations or indentations in the periphery of the drum are appropriately spaced and aligned with the pockets on the conveyor flights whereby, as each line of perforations or indentations on the drum registers with the pockets on the flights, a sprout will be transferred therefrom into each pocket on the flights.

3,653,419
EXTRUDER SCREEN PLATE CHANGE-OVER MECHANISM

Dieter Schutter, Hannover, Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hannover-Kleefeld, Germany

Filed Mar. 25, 1970, Ser. No. 22,574
Claims priority, application Germany, Apr. 16, 1969, P 19 19 269.9
Int. Cl. B29b *5/00*
U.S. Cl. 146—174 3 Claims

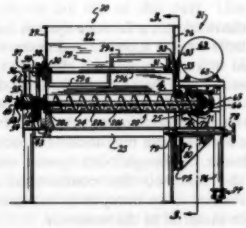


An extruder screen plate change-over mechanism comprises a slide carrying two screen-plates and movable transversely to a flow passage to the mix to place a selected one of the plates in alignment with the flow passage. The plate is clamped in position by a bush forced against the slide by thrust pins arranged uniformly around the bore of the bush. The axis of each pin defines a generator line of the same imaginary cone.

3,653,420
MEAT GRINDER

John G. Viene, Shawnee Mission, Kans., assignor to Koch Supplies, Inc., Kansas City, Mo.

Filed Feb. 24, 1970, Ser. No. 13,459
Int. Cl. B02c *18/22*; B01f *15/02*
U.S. Cl. 146—186 7 Claims

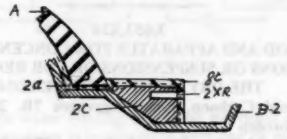


A combination of a feeder mechanism and a high speed grinder with a grinder supporting frame hingedly mounted to a feeder supporting frame to swing outwardly therefrom on castor wheeled legs. A rotatable worm auger to move material from the container of the feeder mechanism to the high speed grinder has an extension received by a rotatable sleeve connected to the motor of the feeder mechanism. A locking pin having a spring loaded retainer ring connects the auger extension and rotatable sleeve. With the spring loaded retainer ring manually depressed, the locking pin can be removed, and with the grinder swung outwardly from the feeder mechanism, the worm auger can be pulled from the feed container through the tubular throat of the feeder mechanism.

3,653,421
TIRE, BEAD BUFFER IN COMBINATION WITH RIM ADAPTORS

Tilden William Johnson, 5630 Sawtelle Blvd., Culver City, Calif.

Filed June 16, 1969, Ser. No. 834,244
Int. Cl. B60c *17/04*
U.S. Cl. 152—158 12 Claims

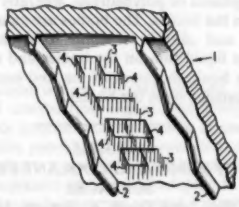


A flexible Buffer for tubeless tires upon loss of air capable of stiffening a tire bead against dirt wedging and swerve sidewall pressure, the buffer base sufficiently narrow to leave enough of the rim drop center open for last tire bead mounting, said buffer attachable to the rim for rim projections in some species and some species attaches to the rim by buffer reinforcing extending under the tire bead, one specie having a lateral extending in shear addition between which addition and basic buffer a novel air shield containing a tube with an air valve, sidewall resembling beads can be secured forming an economical and efficient air cap to said buffer, providing tubeless tire cool running and solid tire assurance, combined with economy of manufacture and ease of installation.

3,653,422
PNEUMATIC TIRES

Tom French, Sutton Coldfield, England, assignor to Dunlop Holdings Limited, London, England

Filed June 19, 1969, Ser. No. 834,714
Claims priority, application Great Britain, June 29, 1968, 31,199/68
Int. Cl. B60c *11/00*
U.S. Cl. 152—209 R 11 Claims



A pneumatic tire and moulding matrix therefore, the tire tread incorporating a traction pattern which changes distictively when only a predetermined amount of tread rubber remains, thus warning the tire user that his tire is approaching the legal or safe limit and will soon have to be replaced or retreaded.

3,653,423

BONDING EPDM TO BUTADIENE RUBBERS

Charles F. Paddock, Wayne, N.J., assignor to Uniroyal, Inc., New York, N.Y.

Filed May 13, 1970, Ser. No. 37,030
Int. Cl. B32b 27/08; B60c 5/00; C08d 11/00
U.S. Cl. 152—330 10 Claims

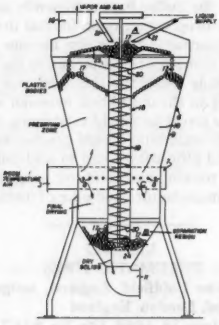
A vulcanized composite laminate comprises a first layer of compounded EPDM rubber and a second compounded layer of butadiene-styrene rubber, a polybutadiene rubber or a blend of polybutadiene rubbers. The layers are bonded by depositing between them, prior to vulcanization, a graft copolymer consisting of an ethylene-propylene-ethylidene norbornene copolymer onto which has been polymerized butadiene and styrene; and a method of forming such composite rubber laminates.

3,653,424

METHOD AND APPARATUS FOR CONCENTRATING SOLUTIONS OR SUSPENSIONS OR FOR RECOVERING THE DRY SUBSTANCE THEREOF

Eric Harald Carlsson, Planteringsvagen 7B, 26200 Angelholm, Sweden

Filed Oct. 30, 1969, Ser. No. 872,635
Claims priority, application Sweden, Oct. 31, 1968, 14751/68
Int. Cl. B01d 1/14; B05c 7/14; B01d 47/16
U.S. Cl. 159—16 4 Claims



A method and an apparatus for subjecting a liquid containing dissolved or suspended dry substance to treatment with air to concentrate the solution or the suspension or to recover the dry substance. The liquid is spread and distributed onto a great many bodies in the form of partly interengaging spheres or polyhedrons, whereby the air can flow forth between the bodies. The bodies are caused to move in a closed path and also in relation to each other thereby disturbing the liquid film on the bodies and accelerating the escape of the liquid in gaseous form and ensuring loosening of the dry substance from the bodies.

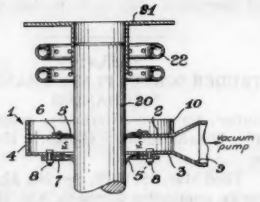
3,653,425

METHOD OF REMOVING COOLANT FROM METAL SURFACES

Herbert E. Elliott, and Frank A. Simons, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed July 29, 1970, Ser. No. 59,075
Int. Cl. B22d 11/12
U.S. Cl. 164—89 1 Claim

An apparatus for removing coolant from a moving metal surface which comprises a housing defining a chamber, having an opening therein facing the moving metal surface; a flexible contacting member attached to at least the leading edge of the housing opening, and preferably to both the leading and trailing edges of the housing opening, in contact with the metal surface; and suction means connected to the housing to evacuate the chamber. Such apparatus can be used in a method of removing coolant from metal surfaces by contacting the surface with a flexible member and passing the surface through a suction zone.

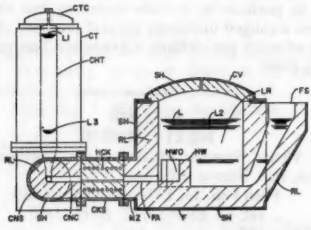


3,653,426

FURNACE POURING AND CASTING SYSTEM

Daniel Edward Groteke, and Donald Keith Lazor, both of Louisville, Ky., assignors to American Standard Inc., New York, N.Y.

Filed June 12, 1969, Ser. No. 832,792
Int. Cl. B22d 27/16
U.S. Cl. 164—257 37 Claims



The disclosure covers a furnace system including therein a furnace or ladle having a good-sized reservoir which is fluidically coupled to a tower, called a charging tower, into which molten material from the reservoir is to be drawn by suction. The molten material is then transmitted under pressure into the cavity of a mold system, and the path from the charging tower to the mold system may include a second tower, called a pouring tower. Although both towers are fluidically connected to the reservoir the connections are arranged to prevent or reduce to an acceptable minimum, the back-flow of the molten material to the reservoir.

3,653,427

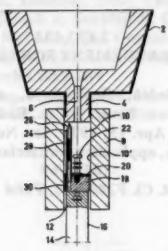
DUMMY BAR MECHANISM

Clive Evans, Cardiff, England, assignor to Mitsubishi Heavy Industries, Ltd., Tokyo, Japan

Filed July 14, 1970, Ser. No. 54,700
Claims priority, application Sweden, July 21, 1969, 11175/69
Int. Cl. B22d 11/08
U.S. Cl. 164—274 14 Claims

A dummy bar mechanism for the continuous casting of metals in a mold sealingly connected with a casting vessel, comprising a starter head means destined to sealingly engage

with said mold. The starter head means is equipped with a ventilation opening extending therethrough, and means are



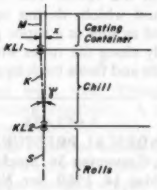
provided for preventing discharge of liquid metal through such ventilation opening.

3,653,428

APPARATUS FOR ALIGNING CONTINUOUS CASTING MOLD WITH THE CASTING METAL SUPPLY VESSEL

Hans Bieri, Oberrick, Switzerland, assignor to Erik Olsson AG, Zurich, Switzerland

Filed July 15, 1969, Ser. No. 841,832
Claims priority, application Switzerland, July 19, 1968, 10868
Int. Cl. B22d *11/10*
U.S. Cl. 164—281 **5 Claims**



In case of oscillating chills, mechanical disturbances in operation of the installation frequently occur because the chill sticks to the nozzle or when a large one-sided deposit between the nozzle and the interior wall of the chill is formed, which affects the life of this part. This shows that these mechanical disturbances can be basically associated with the nozzle slightly changing its position and/or its direction in the course of the casting process. This position or direction change of the nozzle is connected with the thermal effects, those to which the wall of the casting container supporting the nozzle is exposed. The changes of the position between the surface of the nozzle and the wall of the chill resulting from the changes of the position, or direction, of the nozzle can also lead to molten metal entering the slot between the corresponding opposed surfaces of the chill and of the nozzle, which occasionally leads to blocking of the chill when this metal solidifies in the slot.

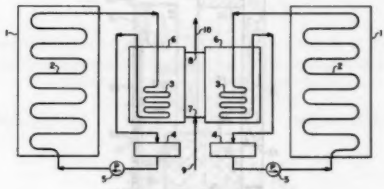
3,653,429

WATER HEATING SYSTEM

Willis Thompson Lawrence, Winchester, Mass., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

Filed May 6, 1969, Ser. No. 822,243
Int. Cl. F28d *15/00*
U.S. Cl. 165—1 **4 Claims**

Several heat storage modules may be connected by manifold means to one or more water holding tanks. The heat storage modules may be connected either in parallel or series to water holding tanks. A single water holding tank may be employed in which a separate condenser is provided for each heat storage module or in which a common condenser is employed within the water holding tank. Furthermore, several heat storage modules may be connected in se-



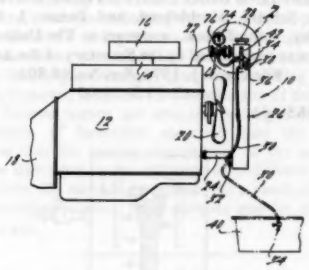
ries to a single water holding tank. The provision of several heat storage modules in conjunction with one or more water holding tanks effects a more dependable water heating system by providing larger heat storage capacity, more constant heat delivery over a given period of time, and more convenient unit size.

3,653,430

RADIATOR CONSTRUCTION

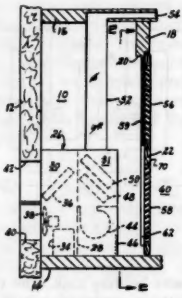
Leonard L. Kinast, 31437 Brown, Garden City, Mich.

Filed Apr. 8, 1969, Ser. No. 814,379
Int. Cl. F01p *11/02*
U.S. Cl. 165—11 **2 Claims**



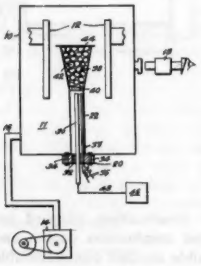
A radiator construction adapted for use with a water cooled internal combustion engine and comprising a first relatively flexible conduit communicable at one end thereof with a drain outlet provided at the lower end of the radiator, the conduit having a manually actuatable pet cock valve or the like on the opposite end thereof adapted to be opened so that the conduit may be directed toward a suitable receptacle adapted to receive the contents of the radiator; a second relatively flexible conduit communicable with the upper end of the radiator and being provided with a manually actuatable relief valve and a pressure gauge, the relief valve being adapted to be opened when the internal pressure in the radiator, as indicated by the gauge, is in excess of a predetermined magnitude so as to relieve the pressure of the radiator and thereby prevent injury to a person subsequently opening or removing the radiator cap on the radiator.

3,653,431
AIR CONDITIONER CLOSET DOOR CONSTRUCTION
Joseph D. Loveley, Grosse Pointe Woods, Mich., assignor to American Standard Inc., New York, N.Y.
Filed Nov. 5, 1970, Ser. No. 87,125
Int. Cl. F24f 3/00
U.S. Cl. 165—53 4 Claims



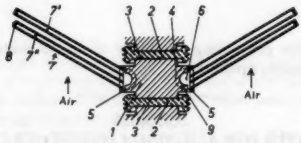
An air conditioner within the closet of a living space, said closet having a special access door equipped with dampered openings adjacent its top and bottom edges. During the cooling season the air conditioner draws its supply air from the upper door openings, and during the heating season the air conditioner draws its supply air through the lower door openings. The invention improves air conditioner efficiency and minimizes stratification and temperature differentials between the floor and ceiling.

3,653,432
APPARATUS AND METHOD FOR UNIDIRECTIONALLY SOLIDIFYING HIGH TEMPERATURE MATERIAL
Frederick Schmid, Marblehead, and Dennis J. Viechnicki, Wellesley, both of Mass., assignors to The United States of America as represented by the Secretary of the Army
Filed Sept. 1, 1970, Ser. No. 68,803
Int. Cl. F25b 29/00
U.S. Cl. 165—61 14 Claims



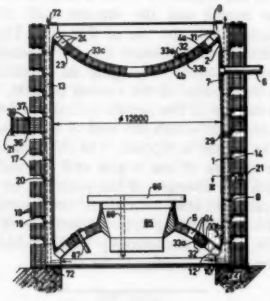
An apparatus and method for unidirectionally solidifying high temperature materials comprising a graphite resistance furnace having a heat exchanger vertically positioned in the chamber thereof. The heat exchanger has inlet and exit means for the passage of an inert coolant gas therethrough. In operation, a crucible is loaded with a seed and the ceramic material to be melted and positioned in the interior of the chamber of the furnace in contact with the heat exchanger. The temperature of the melt is raised to about 50° C above its melting temperature. The melt temperature is slowly decreased with a correspondingly increase in the flow of the inert coolant gas through the heat exchanger thereby unidirectionally solidifying the material to produce a single crystal.

3,653,433
COOLING ARRANGEMENT FOR SEMICONDUCTOR VALVES
Otto Scharli, Baden, Switzerland, assignor to Aktiengesellschaft Brown, Boveri & Cie., Baden, Switzerland
Filed Apr. 15, 1970, Ser. No. 28,616
Claims priority, application Switzerland, Apr. 30, 1969, 6576/69
Int. Cl. F28f 7/00; F28d 15/00
U.S. Cl. 165—80 11 Claims



A cooling arrangement for the operating components of an electronic system such as semiconductor valves in disk form comprises cylindric heat sinks having the end faces in contact with the faces of adjacent semiconductor valves to establish flow of heat from the semiconductor disks to the heat sinks, an annular vessel formed at the periphery of each heat sink and a radial array of inclined cooling pipes communicating with the interior of the vessel. The vessel is partially filled with a cooling fluid which, during operation of the valve system is in a liquid as well as a vapor phase. The fluid vapor is forced outwardly along the tubes where it is re-condensed along the tube walls and flows back by gravity.

3,653,434
CYLINDRICAL PRESSURE VESSEL
Sigfrid Andersson, Grevgatan 36, Stockholm, Sweden
Filed May 14, 1969, Ser. No. 824,563
Claims priority, application Sweden, May 17, 1968, 6755/68
Int. Cl. F28f 3/12
U.S. Cl. 165—169 13 Claims

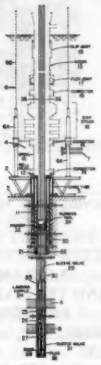


A pressure vessel consists of a comparatively thin-walled container and a pressure-resistant construction supporting the container. The pressure-resistant construction comprises girders extending longitudinally, and annular members extending circumferentially around the girders. The girders have top and bottom shoulders to engage top and bottom walls.

3,653,435
MULTI-STRING TUBINGLESS COMPLETION TECHNIQUE

Carl E. Reistle, III, Houston, Tex.; Thomas W. Childers, Woodland Hills; Joseph A. Burkhardt, Chatsworth, both of Calif.; Dewitt L. McLallen, Jr., Corpus Christi, Tex., and Carroll A. Woolley, Chatsworth, Calif., assignors to Esso Production Research Company

Filed Aug. 14, 1970, Ser. No. 64,519
Int. Cl. E21b *43/00*
U.S. Cl. 166—.5 18 Claims

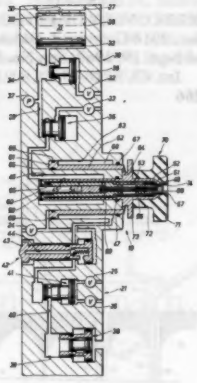


Method and apparatus for completing multi-string tubingless underwater wells with through flowline (TFL) pumpdown tool servicing capability. A subsea borehole is drilled through the productive oil and/or gas formations. At least two parallel small diameter casing strings are run into the borehole guided by a riser assembly. These casing strings have a common hanger at their upper ends and are connected together at various levels with a plurality of gas-lift crossover mandrels and at least two (upper and lower) circulation crossover mandrels for tool circulation. Then a Xmas tree is lowered on a disconnectable running pipe to a wellhead guided by guidelines. The Xmas tree has at least two parallel small diameter casing strings extending from the lower end thereof. These upper casing strings have a common connector on their lower ends for connection to the hanger. Each upper casing string fluidly communicates with a lower casing string through the connector and hanger. A tensioner located in the Xmas tree applies tension to both the upper and lower sections of casing strings and properly spaces out the upper ends of the upper sections of casing strings in the Xmas tree. The upper ends of the casing string sections in the Xmas tree are connected to a production manifold. Suitable control fluid conduits are lowered with the Xmas tree for operation of the tensioner and for operation of safety valves located in each of the upper sections of casing strings. The lower circulation crossover port between two of the casing strings is then opened for perforating operations. A perforator gun is landed in a landing nipple adjacent a formation and is reciprocated until it rotates to the proper direction to avoid perforating the other pipe string in the borehole and then is fired. After each of the formations has been perforated, production of the formation may be maintained by natural formation energy. Various well servicing operations may be carried out using pump-down tools and techniques. A producing formation or zone may be blocked off using a pump-down patch tool and the well fluids may be artificially lifted by positioning pump-down gas-lift valves in one of the casing strings.

3,653,436
FORMATION-SAMPLING APPARATUS

Ronald A. Anderson, and Frank R. Whitten, both of Houston, Tex., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Mar. 18, 1970, Ser. No. 20,685
Int. Cl. E21b *49/00*
U.S. Cl. 166—100 26 Claims



In the representative embodiment of the new and improved fluid-sampling apparatus disclosed herein, sample-admitting means adapted to be selectively extended therefrom include an annular sealing pad operatively arranged around the forward end of a tubular sampling member so that, upon contacting a well bore surface, the pad will make firm sealing engagement therewith. First new and improved means are provided for delaying the establishment of flow communication between a sample-collecting system in the apparatus and an earth formation being tested until the sample-admitting means have been extended and mudcake and formation materials that might otherwise plug the sampling apparatus have been removed from the forward portion of the sampling member. Second means are uniquely arranged for limiting the admission of formation materials into the sampling member so that the sealing engagement of the sealing pad will not be disrupted by the entrance of additional formation materials into the sampling member. As a result of this new and improved apparatus, fluid samples can be obtained at high flow rates.

3,653,437
VISCOUS SURFACTANT WATERFLOODING

Walter W. Gale; Milton O. Denekas, both of Houston, Tex., and Stanley J. Storfer, Edison, N.J., assignors to Esso Production Research Company

Filed May 25, 1970, Ser. No. 40,240
Int. Cl. E21b *43/22*
U.S. Cl. 166—252 10 Claims

A method of recovering oil from a subterranean formation using an aqueous surfactant solution with a predetermined and controlled viscosity. The ability of the surfactant to impart viscosity to the aqueous solution is dependent upon the

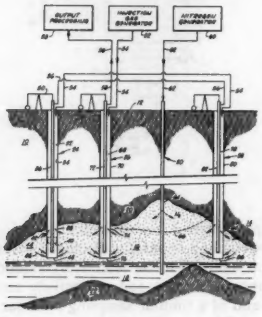
ratio of water-insoluble/pentane-insoluble sulfonates. This ratio must be maintained within the range of 0.01 to 0.30 to produce a surfactant with desirable oil-recovery properties. The ratio can be maintained within this range and varied in value to change the viscosity-imparting properties of the surfactant by adjusting the process reaction conditions.

3,653,438

METHOD FOR RECOVERY OF PETROLEUM DEPOSITS

Robert J. Wagner, 2014 Gatewwod, Oklahoma City, Okla.

Filed Sept. 19, 1969, Ser. No. 859,293
Int. Cl. E21b *43/24, 43/18*
U.S. Cl. 166—266 **10 Claims**



A method for recovery of petroleum deposits, particularly those deposits which are underlain by a water zone, which method includes the steps of introducing a dissolving gas product into an upper region of a petroleum deposit to enable gravity head build-up of more soluble petroleum products which then flow downward toward a recovery zone for delivery to a surface recovery unit. The method is particularly adaptable for utilization with a single well-bore whereupon a dissolving injection gas can be introduced down an outer annulus of the pipe string while recovered petroleum can be withdrawn from a lower recovery zone for conduction up a tubing string or such to the earth's surface. An inert gas introduced through another bore into upper regions of the deposit serves to maintain proper pressure balance throughout the system.

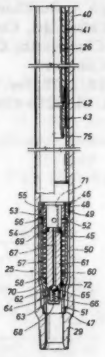
3,653,439

SUBSURFACE SAFETY VALVE

James W. Kisling, III, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed June 1, 1970, Ser. No. 42,372
Int. Cl. E21b *33/00*
U.S. Cl. 166—226 **16 Claims**

A combination slip joint and safety valve apparatus including an inner member telescopically and non-rotatably disposed within an outer member, a barrier means for blocking the bore through said members, a normally open flow course extending past said barrier means and adapted to be closed by a longitudinally movable valve sleeve, a means responsive to complete telescoping or closing movement of



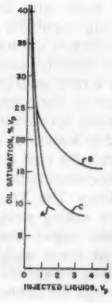
said members for moving said valve sleeve from open to closed position.

3,653,440

SECONDARY AND TERTIARY OIL RECOVERY PROCESS

Joseph Reisberg, Houston, Tex., assignor to Shell Oil Company, New York, N.Y.

Filed Mar. 23, 1970, Ser. No. 21,799
Int. Cl. E21b *43/22*
U.S. Cl. 166—273 **9 Claims**



A waterflood process for producing oil from an underground reservoir is improved by injecting an oil-displacing surfactant system, a gas, and an aqueous drive liquid so that, within the reservoir, the relative permeability of liquid that is injected and displaced is reduced by the gas.

3,653,441

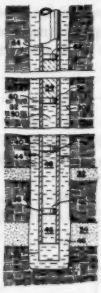
PROCESS FOR CEMENTING WELL BORES

Robert N. Tuttle, Houston, Tex., assignor to Shell Oil Company, New York, N.Y.

Filed June 3, 1970, Ser. No. 43,070
Int. Cl. E21b *33/14*
U.S. Cl. 166—291 **10 Claims**

A process for cementing well bores is disclosed wherein high viscosity drilling mud in the area to be cemented is displaced by a liquid slug which in turn is displaced by a lower viscosity cement. The leading edge of the liquid slug has a viscosity substantially equal to or greater than the viscosity of

the drilling mud during displacement thereof. The viscosity of the trailing edge of the liquid slug is substantially equal to



or lower than the viscosity of the cement during displacement of the liquid slug.

3,653,442

STIMULATING LOW PRESSURE NATURAL GAS PRODUCING WELLS

Rupert D. Ross, Robinson, Ill., assignor to Marathon Oil Company, Findlay, Ohio

Continuation-in-part of application Ser. No. 762,129, Sept. 24, 1968, now Patent No. 3,554,288. This application Mar. 16, 1970, Ser. No. 20,098

Int. Cl. E21b *43/25*

U.S. Cl. 166—305 R **14 Claims**

Water blockage in subterranean formations, commonly known as water coning, is effectively removed by injecting into the formation a sufficient amount of a micellar solution to contact the area of water blockage. The micellar solution "solubilizes"the water to facilitate the flow of hydrocarbon toward the well bore.

3,653,443

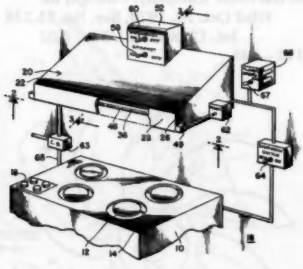
FIRE EXTINGUISHING SYSTEM FOR COOK STOVES AND RANGES

Walter E. Dockery, 2120 La Vera Dr., Tuscaloosa, Ala.

Filed Sept. 25, 1970, Ser. No. 75,403

Int. Cl. A62c *3/00*

U.S. Cl. 169—2 R **9 Claims**



An automatic fire extinguishing system for a cooking range having top burners includes a hood mountable over the range. A tank containing fire extinguishing fluid is removably mounted in the hood. The tank has a solenoid operated valve connected in circuit with a thermostat and power line to discharge fluid from the tank when the thermostat is operated. The range may have electric or gas burners. A solenoid operated switch or solenoid operated valve is connected in circuit with the thermostat to open the power line to the electric burners or to open the gas main to the gas burners when the thermostat operates. An automatically operated exhaust fan and alarm are also provided. The system includes manually operable set and reset switch means.

3,653,444

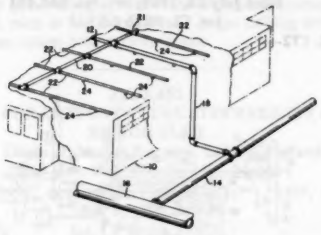
FIRE PROTECTION SYSTEM

William L. Livingston, 283 Norwood St., Sharon, Mass.

Continuation-in-part of application Ser. No. 864,612, Oct. 8, 1969, and a continuation-in-part of 885,501, Dec. 16, 1969. This application Sept. 15, 1970, Ser. No. 72,333

Int. Cl. A62c *35/00*

U.S. Cl. 169—5 **25 Claims**



An automatic fire protection system for protecting buildings. Direct spray nozzles are used in place of the conventional sprinkler heads. The nozzles have larger outlet orifices to deliver larger quantities of extinguishant with larger size droplets as compared to sprinkler heads. The system is designed to limit the number of nozzles which will be actuated by a high challenge fire and the supply of extinguishant is designed to accommodate only the limited number of nozzles. With this system, the effectiveness of these nozzles in fighting the fire is not diminished by the opening of a large number of additional nozzles which would divert the extinguishant to areas remote from the fire where it serves no useful purpose and increases the damage to items located in these remote areas.

3,653,445

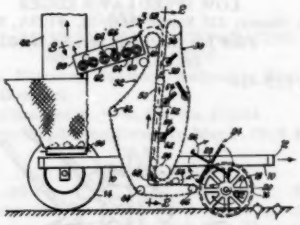
BEET HARVESTER

Andrew F. Barnes, R.R. 1 Box 292, Longmont, Colo.

Filed Nov. 19, 1970, Ser. No. 90,901

Int. Cl. A01d *17/00*

U.S. Cl. 171—58 **16 Claims**



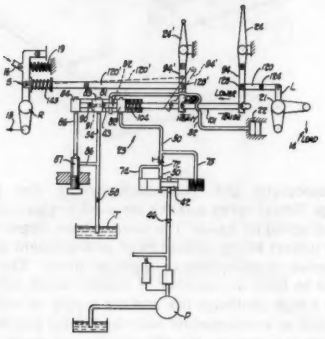
This invention is addressed to an improved beet harvester including a hugger chain assembly forming a forward hugger chain and a rearward hugger chain, each of which include a rising portion with the rising portions of each of the hugger chains being substantially parallel to thereby define a space therebetween adapted to receive beets in a pressure engage-

ment to elevate and clean the beets, with the rear hugger chain including a conveyor portion which extends in a forward direction to receive beets removed from the ground by lifter wheels for feeding the beets so removed to the space defined by the rising portions of the hugger chains to further enhance the cleaning, and a grab roll bed communicating with the space between the rising portions of the hugger chains including at least two pair of driven rolls to further clean the beets fed to the grab rolls from the hugger chain assembly.

3,653,446
DRAFT AND POSITION CONTROL FOR TRACTOR DRAWN IMPLEMENTS

Dennis H. Kalmon, Eden Prairie, Minn., assignor to White Farm Equipment Company

Filed July 24, 1969, Ser. No. 844,481
Int. Cl. A01b *63/112*
U.S. Cl. 172—4 **10 Claims**

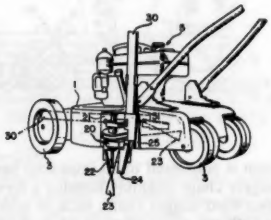


The disclosure pertains to an agricultural tractor having a draft and position responsive hitch control for maintaining an implement at a constant working depth in spite of varying working conditions. The hitch is activated by a power cylinder to vary the working depth of the implement drawn by the tractor. A valve controls the power cylinder and is arranged to receive draft or position command and feedback signals from an actuating linkage including a yoke lever and one-way link which coordinates the command and feedback signals controlling the valve.

3,653,447
LOW SPEED LAWN EDGER

John H. Stoner, 425 South 156th St. #129A, Seattle, Wash.

Filed Jan. 22, 1970, Ser. No. 4,802
Int. Cl. A01b *45/00*
U.S. Cl. 172—16 **17 Claims**

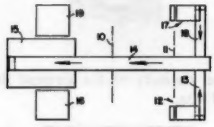


A low blade speed rotary edger useful as an independent tool or as an attachment to a conventional power mower includes a (1) cultivator-rotary blade turning on a vertical shaft and (2) a shearing bar contacting the rotary blade. When used as an attachment for a power mower the rotary blade is connected to the power source of the mower by a belt and pulley system or other suitable drive means. The edger assembly mounted on the power mower is provided with means for retracting the edger to an inoperative position when it is not needed.

3,653,448
SOD HARVESTING VEHICLE

Donald W. Morrill, Hanna, Ind., assignor to Big J. Products, Inc., Hanna, Ind.

Filed Feb. 6, 1970, Ser. No. 9,237
Int. Cl. A01b *45/04*
U.S. Cl. 172—19 **4 Claims**

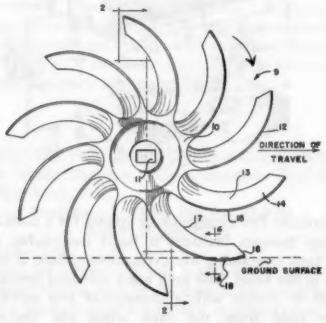


A sod harvesting vehicle having means at the forward end for simultaneously rolling pre-cut sod into rolls and elevating same from the ground, a transverse conveyor adapted to transport sod rolls laterally from the rolling and elevating means, a longitudinal conveyor in effective relation with the transverse conveyor for transporting sod rolls longitudinally to the rear of the vehicle and a platform for personnel and pallet handling means at the rear of the vehicle. In preferred form, the vehicle has two sod rolling and elevating means, one on each forward side of the vehicle, two transverse conveyors and two pallet handling means, one on each rearward side of the vehicle. The two rolling and elevating means enable the vehicle to harvest sod back and forth continuously along the same edge of a sod field, thereby avoiding nonproductive trips back to the beginning end of the field, and the two pallet handling means enable operators to load two pallets with rolled sod more or less simultaneously, thereby keeping pace with the high production capability of each rolling and elevating means.

3,653,449
ROTARY CULTIVATOR WHEEL

Charles Boetto, Naperville; John F. Stufflebeam, Lockport, and Noel G. Artman, Chicago, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Oct. 16, 1970, Ser. No. 81,238
Int. Cl. A01b *21/02, 23/02*
U.S. Cl. 172—548 **8 Claims**



A rotary hoe wheel is adapted to be propelled at an angle to the direction of travel and is provided with teeth extending

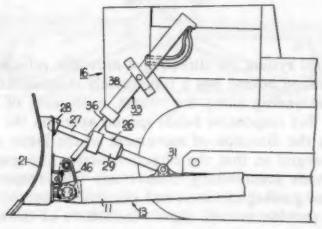
radially from a hub and curved rearwardly with the surface of the ground being first engaged by a curved portion of each tooth between the hub and the outer end thereof. A cross-section of the tooth is disposed in a tilted plane to provide an earth penetrating leading edge and each tooth has a lower convex surface and an upper concave surface forming a scoop to lift and turn the soil.

3,653,450

TILT COMPENSATION LINKAGE FOR TILTING BULLDOZER MOLDBOARD

Harvey W. Rockwell, and Wesley A. Poore, both of Springfield, Ill., assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed June 1, 1970, Ser. No. 41,899
Int. Cl. E02f *3/76*
U.S. Cl. 172—803 **7 Claims**



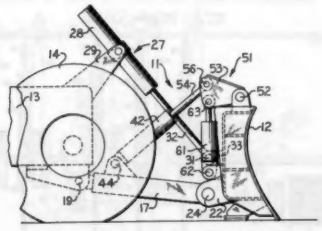
Compensating linkage for a tilting bulldozer moldboard including a link depending from the rear of the moldboard with its lower end pivotally connected, at longitudinally spaced points, to the two dozer push arms.

3,653,451

TILT LINKAGE FOR BULLDOZER BLADE MOUNTING ASSEMBLIES

Max D. Fryrear, and Eugene M. Wilson, both of Joliet, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 9, 1970, Ser. No. 1,623
Int. Cl. E02f *3/76*
U.S. Cl. 172—804 **11 Claims**



A mounting assembly providing for tilt adjustment of a bulldozer blade. The blade is pivotally supported by a pair of push arms. Motor means are pivotally interconnected between the respective push arms and the blade for adjusting blade pitch with one of the motor means being connected with the blade by means of a pivotal link. The blade is tilted by additional motor means interconnected between the blade and the link.

3,653,452

METHOD FOR REDUCING EROSION AND CORROSION OF METAL SURFACES DURING GAS DRILLING

Paul W. Fischer, 836 W. Beverly Blvd., Whittier, Calif.; George P. Maly, 800 Bison St., Newport Beach, Calif., and Delbert E. Pyle, 283 Oaktree Drive, Santa Rosa, Calif.

Filed June 8, 1970, Ser. No. 44,661
Int. Cl. E21b *21/04*
U.S. Cl. 175—69 **17 Claims**

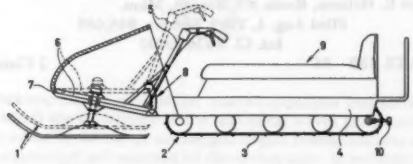
Erosion and corrosion of metal surfaces exposed to a flowing stream of hot gases containing dispersed particles of solid material is reduced by introducing into the flowing stream an additive that decomposes at the temperature and pressure of the gas to release ammonia or a vaporous amine and form a resinous residue. The additive is preferably introduced into the gas in an inert carrier liquid. The method is especially useful in reducing erosion and corrosion of metal drill pipe used in the gas drilling of wells into high temperature earth formations, such as are encountered in gas drilling wells into subterranean steam-bearing formations.

3,653,453

DEVICE FOR IMPROVING THE STEERABILITY OF A MOTOR SLED

Jussi Antti Tiitola, Takkulan Kartano, Lahti 3, Finland

Filed Mar. 31, 1970, Ser. No. 24,255
Claims priority, application Finland, Apr. 1, 1969, 948/69; Mar. 5, 1970, 609/70
Int. Cl. B62m *27/02*
U.S. Cl. 180—5 R **2 Claims**



A mechanical or hydraulic lifting device provided in a motor sled for improving its steerability, by means of which the relationship in height between the steering device, such as a ski element, and the traction surface or part of the traction surface of the propagation device, such as an endless track, is made variable during driving.

3,653,454

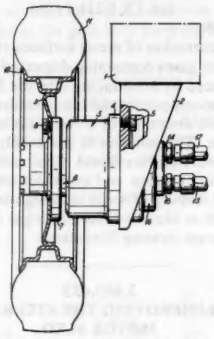
WHEEL-DRIVE SYSTEM INCORPORATING A HYDRAULIC MOTOR

Soren Nielsen, Hinnerup, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Apr. 8, 1970, Ser. No. 26,654
Claims priority, application Germany, May 5, 1969, P 19 22 832.1
Int. Cl. B60k *7/00*
U.S. Cl. 180—66 F **6 Claims**

The invention relates to a wheel drive system incorporating a hydraulic motor of the toothed wheel type. The motor portion comprises a rotating casing and a stationary shaft member. The motor casing is rotatably journalled in a hub member and the casing has a flange to which a ground engaging wheel may be attached. Expanding and contracting chambers are formed by relative movement between a toothed ring member which is fixedly attached to the casing for rotation therewith and surrounds a toothed wheel member, the ring member being rotatable about its own axis

and the toothed wheel member is capable of only orbital movement about the ring axis. The casing and shaft member



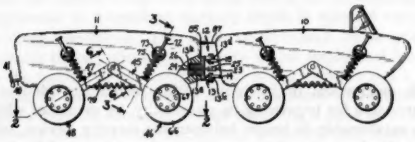
having cooperating fluid passages for feeding and exhausting the expanding and contracting chambers.

3,653,455

OFF-ROAD VEHICLE WHEEL SUSPENSION

Allen E. Hetteen, Route #3, Roseau, Minn.

Filed Aug. 1, 1969, Ser. No. 846,689
Int. Cl. B62d *53/00*
U.S. Cl. 180—85 2 Claims



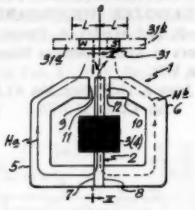
An articulated off-road vehicle is shown, having a front body portion and a rear body portion, connected for pivotal movements relative to each other about a substantially vertical axis, and for twisting movements relative to each other about a longitudinally extending, substantially horizontal axis. A drive shaft powered by an engine extends through the connections between the body portions, and is provided with a universal joint to accommodate the pivotal movement. An axle is mounted on each body portion and a differential for each axle is driven by the drive shaft. A wheel assembly, mounted on each end of each axle, has first and second wheel support arms each journaled at an upper end thereof on the axle, with the first arm extending forwardly and downwardly therefrom, and the second arm extending rearwardly and downwardly therefrom. A wheel is rotatably mounted on the lower end of each arm and a drive chain extends from the axle to each wheel for driving the wheel. A spring is connected between the arms intermediate the ends thereof to exert a force tending to draw the arms and attached wheels together.

3,653,456

CONTROL SYSTEM FOR MOVING VEHICLE ALONG A PREDETERMINED PATH

Saburo Uemura, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 24, 1970, Ser. No. 22,279
Claims priority, application Japan, Apr. 14, 1969, 44/28835
Int. Cl. B62d *1/24*
U.S. Cl. 180—98 9 Claims



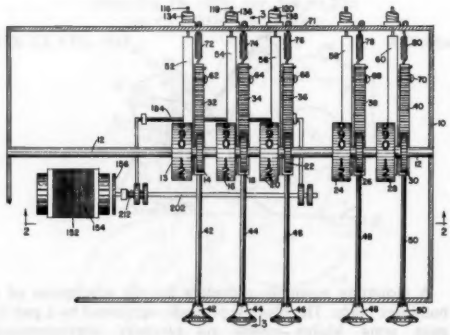
A control system for directing a movable vehicle along a predetermined course has a transversely magnetized guiding element extending along the course, a plurality of dual-gap magnetic flux responsive heads spaced apart on the movable vehicle in the direction of movement of the latter and each being arranged so that the direction across the gaps of the head extends substantially transversely with respect to the magnetized guiding element, and circuits connected with the heads to provide control signals indicative of deviations of the vehicle from the course and by which steering of the vehicle is controlled for maintaining the vehicle on the course. Additional magnetic heads may be provided on the vehicle to detect the magnetic fields of associated magnets arranged at selected locations along the course, and circuits are connected to such additional heads to provide respective control signals by which the speed of movement and/or stopping of the vehicle are controlled.

3,653,457

ANTI-THEFT DEVICE FOR AUTOMOTIVE VEHICLES AND OTHER APPARATUS

Walfrido R. Lopez, 24-46 44th Street, Astoria, N.Y.

Filed Jan. 8, 1970, Ser. No. 1,371
Int. Cl. B60r *25/04*
U.S. Cl. 180—114 8 Claims



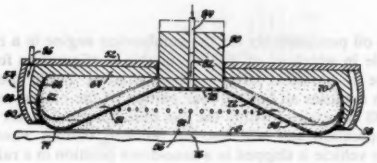
New and improved anti-theft device for use in automobiles and the like is provided and comprises fuel flow control means which, when activated, are effective to prevent fuel flow to the automobile engine and, when deactivated, will

not interfere with such fuel flow. Means are included to automatically activate said fuel flow control means upon the turning off of the automobile ignition. Additional fuel flow control means which include an auxiliary fuel tank of relatively limited capacity are included and are operable, when activated, to enable limited movement of the automobile as for movement in a parking lot or the like.

3,653,458
COMBINED PERIPHERAL JET AND PLENUM CHAMBER AIR CUSHION DEVICE

Richard H. Donlon, Troy, Mich., assignor to Transportation Technology, Inc., Madison Heights, Mich.

Filed Oct. 29, 1969, Ser. No. 872,019
Int. Cl. B60v *1/02, 1/04*
U.S. Cl. 180—124 **14 Claims**

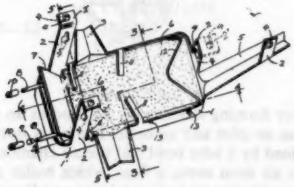


An air cushion device comprising a base and nozzle means for providing an endless jet curtain beneath the base to confine a cushion of air for supporting the base above a surface when air under pressure is supplied to the nozzle means. A flexible diaphragm is selectively extendable to form a plenum chamber beneath the base having a compliant peripheral wall projecting beneath the base a distance at least as far as the lower end of the nozzle means so as to confine a cushion of air for supporting the base above a surface when air under pressure is supplied to the plenum chamber and permitted to escape only through the clearance slot or gap between the compliant peripheral wall and the surface over which the base is supported.

3,653,459
SURFACE, MATERIAL AND HEALTH PROTECTIVE DEVICE

Peter Andrews, 190 Gebhardt Road, Penfield, N.Y.

Original application June 17, 1963, Ser. No. 288,159, now abandoned. Divided and this application Oct. 21, 1965, Ser. No. 508,624. The portion of the term of this patent subsequent to May 2, 1985, has been disclaimed.
Int. Cl. B62d *25/20*
U.S. Cl. 180—69.1 **18 Claims**

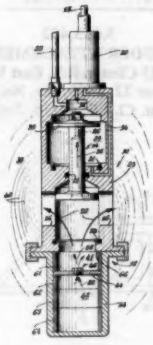


A fluid retaining receptacle device which is removably secured to the underside of a motor vehicle by use of hanger means which may be connected to the vehicle by using accessible, bolt securing means, holes, clamping means thereof. The device retains fluid which drips therein from at least one portion of the vehicle. The motor vehicle being a car, truck, bus, racing car and even a boat. A generated draft of air, generated by the forward drive motion of at least one of the vehicles, over and against a portion of the fluid retained in the device and/or in a separate material retained in the receptacle portion of the device, which material may further have organic hydrocarbon consuming bacteria and/or inorganic catalyst means for reducing the volume and/or increasing the rate of oxidation and thickening of the fluid retained therein.

3,653,460
SEISMIC ENERGY WAVESHAPE CONTROL APPARATUS AND METHOD

Stephen V. Chelminski, West Redding, Conn., assignor to Bolt Associates, Inc., Norwalk, Conn.

Filed Nov. 14, 1969, Ser. No. 876,861
Int. Cl. G01v *1/14*
U.S. Cl. 181—.5 H **15 Claims**



Seismic energy wave-shape control apparatus and method in which the waveshape of the acoustical waves generated in the water by the use of submerged airgun seismic sources can be controlled and selected by the survey crew to provide the waveshape which is most desirable for use under the conditions being encountered as the survey is being carried out. The pressurized gas holding charge container is provided with a plurality of chambers such that an initial abrupt flow of pressurized gas as shown at **50** in FIG. **2** occurs from a primary chamber and passes out through the discharge ports into the surrounding water with explosive-like abruptness. Delayed after-flow of pressurized gas as shown at **52** in FIG. **2** then occurs from a secondary chamber for reducing the relative magnitude and changing the waveform of the second pressure peak P2. The relative volumes of the primary and secondary chambers are conveniently changeable by detaching the casing and shifting the position of a removable barrier, thus obtaining differing waveshapes as seen by comparing FIGS. **6**; **7**, and **8** with FIG. **5**. If desired a tertiary chamber may be utilized to provide further changes in the waveshape.

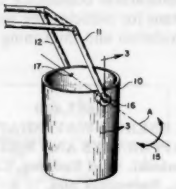
3,653,461
HYDRAULIC ROTARY DAMPENER

Thomas C. Huxley, III, Camarillo, and Franklin W. Doose, Monrovia, both of Calif., assignors to Del Mar Engineering Laboratories, Los Angeles, Calif.

Filed July 23, 1970, Ser. No. 57,562
Int. Cl. B66f *11/04;* **F15b** *15/22*
U.S. Cl. 182—2 **10 Claims**

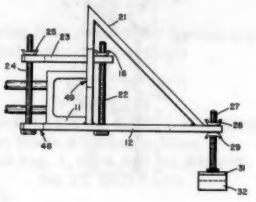
A rotary dampener includes a cylinder with a piston threaded in the cylinder such that relative rotary motion between the cylinder and piston causes axial movement of the piston in the cylinder. Hydraulic fluid in the cylinder is forced through a by-pass passage in the cylinder from one

side of the piston to the other in response to the axial movement of the piston. By restricting the passage, a proper



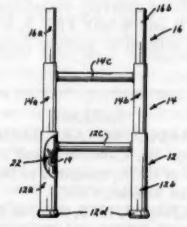
degree of dampening of relative rotary motion between the piston and cylinder and thus between first and second members secured to these components can be realized.

3,653,462
LADDER ATTACHMENT
John J. Courtney, 123 Clinton Rd., East Weymouth, Mass.
Filed June 22, 1970, Ser. No. 48,384
Int. Cl. E06c *5/36, 7/48*
U.S. Cl. 182—108 **4 Claims**



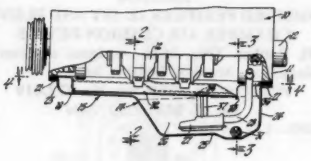
A device for attachment to a ladder which enables the ladder to bridge windows and distribute the force of the ladder over a larger area thereby providing a greater margin of safety against the ladder sliding off the building and at the same time a greater freedom in the work area yet be lighter and inexpensive.

3,653,463
COLLAPSIBLE LADDER ARRANGEMENT
Vernon L. Neal, Ballwin, Mo., and Jerry D. Conyer, Paducah, Ky., assignors to E. T. Hannan & Associates, Inc., Paducah, Ky., a part interest
Filed June 22, 1970, Ser. No. 48,016
Int. Cl. E06c *1/12*
U.S. Cl. 182—195 **4 Claims**



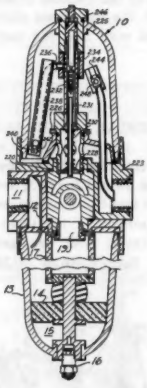
A collapsible ladder arrangement characterized by the use of spring-urged clip members on each ladder section for accomplishing the assembly of one ladder section with the next ladder section in expanding the ladder from a collapsed position.

3,653,464
ENGINE OIL PAN
Eudell G. Jacobsen, Romeo, and David A. Martens, Washington, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Apr. 13, 1970, Ser. No. 27,924
Int. Cl. F01m *11/06*
U.S. Cl. 184—6.2 **3 Claims**



An oil pan assembly for the combustion engine in a motor vehicle in which an oil pan of suitable configuration for the engine is provided with a separate cover baffle member which encloses all but the rear portion of the oil pan so that oil will be retained within the pan during normal motor vehicle operation and will also be retained therein when the motor vehicle is shipped in a nose-down position in a railroad car.

3,653,465
METHOD AND APPARATUS FOR HANDLING COMPRESSED AIR
Harry L. Wheeler, Jr., 1538 Huntingdon Trail, Dunwoody, Ga.
Filed July 31, 1969, Ser. No. 846,339
Int. Cl. F01m *1/08;* **F16n** *7/34*
U.S. Cl. 184—55 A **14 Claims**



A vapor forming device may be used as an air lubricator which has an inlet and an outlet and oil is stored in a reservoir defined by a lube bowl and the air chamber housing. To pass, the air must move a float, which builds up back pressure transmitted to an impact tube to an adjustable pressurizing valve, which when opened permits air to flow down an air feed tube to which is attached a large adjustable, vapor generator tube. Air enters the vapor generator tube through a small passage and oil enters the generator tube through a small hole. The air and oil mix into a foam which has a lower average specific gravity than the oil and is thus forced up into the tube. At the mouth of the vapor generator tube the foam breaks up and disperses into a shower of small droplets ranging upward from a few microns to several hundred microns in

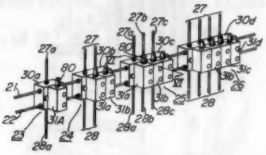
size. Air leaves the oil reservoir through a take-off tube one end of which projects above the surface of the oil in the reservoir and the other end being located in a low pressure zone of an outlet. The device may be made two-stage with air lift pumps and a stand pipe. Another form uses a vibrating reed to separate the air and shatter the oil droplets.

3,653,466

LUBRICANT VALVE ASSEMBLY

Hiroshi Fujita, Shiga-ken, and Akinori Kuruma, Settsu, both of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed June 1, 1970, Ser. No. 42,068
Claims priority, application Japan, Oct. 15, 1969, 44/97968
Int. Cl. F01m *1/06*; F16n *7/14, 13/22*
U.S. Cl. 184—7 D **3 Claims**



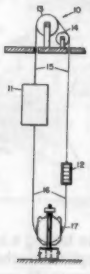
A lubricant valve assembly comprising one manifold block unit and at least one valve element coupled with said manifold block unit. The valve element has only one measuring piston and one valving piston slidably disposed therein, and the manifold block unit has required numbers of inlets and outlets integrally therewith. Further, the manifold block unit is so constructed as to supply lubricant, introduced therein from a lubricant supply pump, to the individual valve elements coupled therewith and to receive measured quantities of lubricant from said respective valve elements and discharge the same to the points to be lubricated. Between the valve element and the manifold block unit is interposed a cross-porting structure, so that the lubricant discharged from a pair of outlet passageways of the valve element may be led to only one of the outlet passageways of said manifold block unit. Further, an adjusting rod to verify the operation of the measuring piston disposed in the valve element is fluid-tightly sealed by a sealing member which is made from polytetrafluoroethylene and hence the lubricant valve assembly is highly resistive to high temperatures.

3,653,467

COMPENSATING SHEAVE APPARATUS FOR ELEVATORS

John Melville Showalter, Clark, N.J., assignor to Otis Elevator Company, New York, N.Y.

Filed Jan. 21, 1969, Ser. No. 792,352
Int. Cl. B66b *11/04*
U.S. Cl. 187—22 **13 Claims**



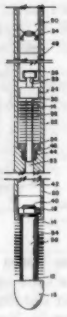
Compensating sheave apparatus for an elevator system having an elevator car, a counterweight, a hoisting machine, hoisting roping and compensating roping, wherein the compensating sheave apparatus includes a tensioning sheave for said compensating roping, a weight frame for said tensioning sheave, fixed guide rails for guiding the weight frame, and a safety device for coupling the weight frame to the guide rails only when the safety device is upwardly accelerated at a predetermined acceleration rate by the weight frame, and wherein the safety device includes coupling members, operative to grip the guide rails when the coupling members are actuated, and an inertial actuator having an inertial mass, operative to actuate the coupling means when the inertial mass senses the predetermined acceleration rate.

3,653,468

EXPENDABLE SHOCK ABSORBER

Gailen D. Marshall, P.O. Box 85, Sugar Land, Tex.

Filed May 21, 1970, Ser. No. 39,491
Int. Cl. F16f *7/12*
U.S. Cl. 188—1 C **9 Claims**



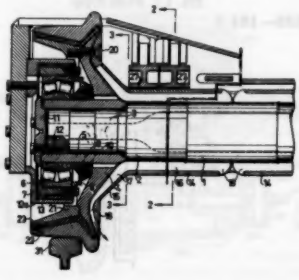
An expendable shock absorber especially adaptable for use with wellbore instruments being go-deviled into the wellbore. The shock absorber has washer-like projections extending from a hollow cylinder. A cutter bar which can slide over the hollow cylinder engages the washer-like projections and upon impact of the survey tool, the shock is expended by the cutter bar shearing off the washer-like projections.

3,653,469

BRAKING SYSTEM FOR RAIL VEHICLES

Lars Erik Landeborg, Per Albin Hanssons vag 52 B, Malmo; Sune Torsten Henriksson, Kvartsvagen 9, and Ragnar Ludvig Muotka, Kyrokogatan 44, both of Kiruna, all of Sweden

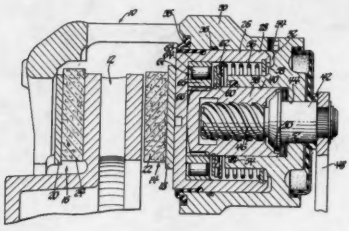
Filed Nov. 20, 1969, Ser. No. 878,476
Claims priority, application Sweden, Nov. 26, 1968, 16064/68
Int. Cl. B61h *1/00*
U.S. Cl. 188—58 **6 Claims**



A wheel axle unit comprising a frame, at least one axle and at least one wheel at each end of said axle is provided with a

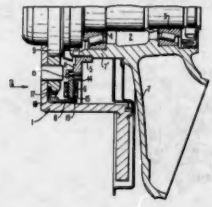
braking system comprising a tubular brake roller at least partially surrounding said axle and spaced therefrom, said brake roller being unrotatably connected to at least one of said wheels, and a pair of brake shoes adapted to engage the outer surface of said brake roller during braking. In a preferred embodiment of the invention the braking roller has a flared end portion provided with radially extending flanges constituting a centrifugal fan for generating a stream of air cooling the brake roller.

3,653,470
DISC BRAKE WITH HYDRAULIC AND MECHANICAL ACTUATION AND WEAR ADJUSTMENT MEANS
William H. Travis, Union, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Sept. 18, 1970, Ser. No. 73,463
Int. Cl. F16d *65/56*
U.S. Cl. 188—71.9 **5 Claims**



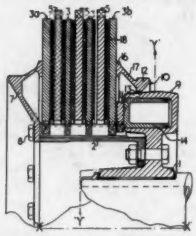
A hydraulically actuable piston is slidable in a first caliper bore and engages a brake shoe assembly. Mechanical actuation is by an adjuster nut slidable in a second caliper bore and threadedly engaging a member which is rotatably received through the wall of the caliper housing so that axial movement is imparted to the adjuster nut and the abutting piston upon rotation of the member. Wear adjustment is through a spring which urges the adjuster nut to advance into retraction limiting engagement with the piston following each hydraulic actuation and a one-way clutch acting between the piston and adjuster nut which permits rotary movement of the adjuster nut in the adjusting direction only.

3,653,471
INSTALLATION FOR THE BRAKE-LOCKING PREVENTION IN VEHICLES
Manfred H. Burckhardt, Waiblingen, and Paul Schwerdt, Esslingen-Hegensberg, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany
Filed Mar. 13, 1970, Ser. No. 19,382
Claims priority, application Germany, Mar. 19, 1969, P 19 13 814.8
Int. Cl. B60t *8/08*
U.S. Cl. 188—181 A **20 Claims**



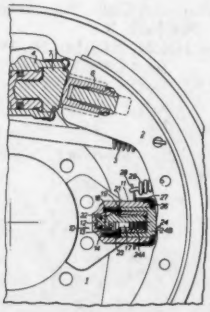
An installation for preventing the locking of the brakes in vehicles, in which sensing elements are provided at the wheels that produce an output signal corresponding to the wheel rotational speed which is fed to a common comparator; the sensing members are each arranged within the area of the wheel mounting outside of the inner and outer wheel bearing.

3,653,472
DISC BRAKES
Frederick S. Dowell, Coventry, England, assignor to The Dunlop Company Limited, Birmingham, England
Filed Sept. 30, 1970, Ser. No. 76,660
Int. Cl. F16d *55/12*
U.S. Cl. 188—217 **26 Claims**



In an aircraft brake a brake thrust transmission member is arranged between a stack of friction members and a circular arrangement of spaced brake actuators to provide even circumferential distribution of the localised thrusts exerted by the actuators. The transmission member has at least one deformable section of frusto-conical shape, an annular ring engaged by the actuators, and another annular ring, which may have two or more co-planar surfaces, for engagement with a friction member.

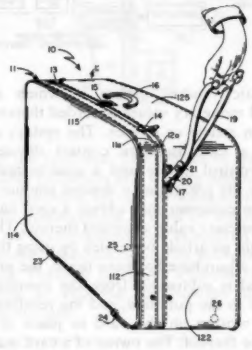
3,653,473
VEHICLE BRAKE CONSTRUCTIONS
Benjamin Andrew Clay, and Glyn Phillip Reginald Farr, both of Kings Rd., Tyseley, Birmingham, 11, England, assignors to Girling Limited
Filed Nov. 3, 1969, Ser. No. 873,316
Claims priority, application Great Britain, Nov. 14, 1968, 54,114/68
Int. Cl. F16d *65/26*
U.S. Cl. 188—353 **10 Claims**



In a drum or disc brake having a locking means for holding the friction elements applied mechanically for parking etc., the locking means is operatively connected to a friction element independently of the normal actuation means. The locking means preferably comprises an extensible strut nor-

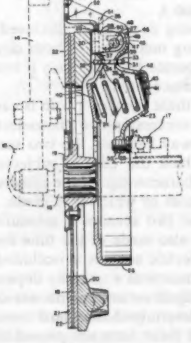
mally free to extend and contract to follow up friction element movements. A clutch is operative to lock the strut in extended condition to apply the lock and is releasable by means of a pressure operated clutch release motor having a piston directly engageable with one of the strut members. To release the lock the piston displaces the said strut member to disengage the friction clutch, whereafter the strut can contract to release the brake. These arrangements therefore cut out lost motion which takes place if (a) the lock acts on a brake actuating linkage instead of on a friction element; or (b) if the clutch release motor acts on the clutch mechanism instead of on the strut itself.

3,653,474
ROLLING LUGGAGE
Bernard D. Sadow, Chappaqua, N.Y., assignor to United States Luggage Corp., Fall River, Mass.
Filed Feb. 16, 1970, Ser. No. 11,383
Int. Cl. A45c *13/00*
U.S. Cl. 190—18 A **3 Claims**



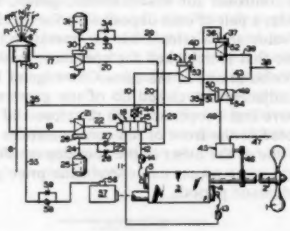
An article of luggage is described which has a plurality of rollers permanently mounted on its bottom wall and a flexible transport strap attached to its upper part.

3,653,475
FRICTION CLUTCH
W. Vincent Thelander, P.O. Box 385, Sugar Loaf Mountain Ranch, Cave Creek, Ariz.
Filed June 1, 1970, Ser. No. 42,013
Int. Cl. F16d *21/00*
U.S. Cl. 192—99 A **11 Claims**



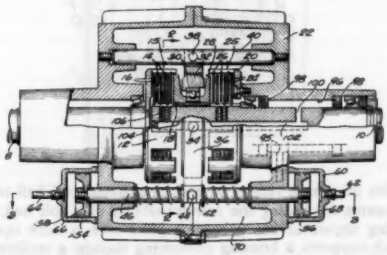
The present small diameter low cost clutch units embody improvements over those of our U.S. Pat. Nos. 1,985,301 and 2,214,789 centered in the release levers, which, while still affording the mechanical advantages of the previously patented clutches of higher engaging pressure with lighter pedal pressure for disengagement, are pivotally connected at their outer ends to the drive lugs on the pressure plate and have novel low friction oscillatable stirrup type fulcrum members to fulcrum the levers near their outer ends on the spider or back plate. These stirrup members compensate by their oscillation for the slight change in center distance between the fulcrum and pivot pin during clutch operation for not only lower friction but reduced wear, while the pivot pin tieup of the levers with the drive lugs on the pressure plate results in the levers giving added engaging pressure due to centrifugal force, which advantage can easily be augmented by adding weight to the back of the levers at their outer ends. The stirrups may be of one piece I-shaped construction, as in one of the present clutches, or of an adjustable type, as in the other clutch.

3,653,476
SLIP CONTROL SYSTEMS FOR AIR CLUTCHES
Clifford W. Allen, and Richard F. Wilson, both of Lexington, Ky., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.
Filed July 29, 1970, Ser. No. 59,103
Int. Cl. F16d *43/24, 25/12*
U.S. Cl. 192—104 F **10 Claims**



Apparatus for automatically modulating the operating pressure supplied to a slip clutch control mechanism driving a ship propeller, whereby the speed of the propeller is maintained constant in accordance with the preselected degree of such operating pressure established by the operator's setting of the controller, particularly during low speed operations.

3,653,477
SELF-COOLING CLUTCH AND BRAKE
Quinten A. Hansen, 4338 Highway 38, Franksville, Wis.
Filed July 21, 1970, Ser. No. 56,905
Int. Cl. F16d *13/72, 65/02*
U.S. Cl. 192—113 B **10 Claims**



A rod which operates the disks of a clutch or brake is provided at its ends with pistons which, in each operation, pump coolant from a sump and eject it onto the disks for the cool-

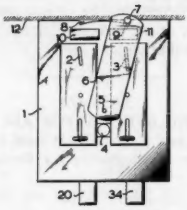
ing thereof. The same pistons may constitute fluid pressure means for the operation of the rod.

3,653,478

COIN CONTROLLER MECHANISM FOR ENTERTAINMENT GAMES ADJUSTABLE TO RECEIVE DIFFERENT COINS

Xaver Leonhart, 8381 Harburg near Landau, Isar, Germany

Filed Apr. 16, 1970, Ser. No. 29,075
Claims priority, application Germany, Apr. 18, 1969, G 69 15 526.6
Int. Cl. G07f 1/02
U.S. Cl. 194—1 E **2 Claims**



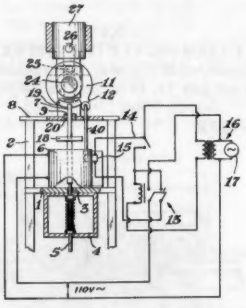
A coin controller for entertainment games, and the like, that includes a pair of coin deposit slots for receiving coins of different value and a release bar for operating the entertainment game that is unlocked for operation by the deposit of specified coins in one of the slots. One edge of the coin controller is adjacent the closed lid of the game and carries a guide groove that cooperates with the closed lid for locking a plate pivoted to the front of the coin controller in a position overlying one or the other of the coin deposit slots so the entertainment game owner can control the price per game for different demand periods.

3,653,479

COIN-ACTUATED GOLF BALL TESTING APPARATUS

Larry B. Phillips, Bay City, Mich., assignor to New Golf, Inc., Essexville, Mich.

Filed Mar. 23, 1970, Ser. No. 21,713
Int. Cl. G07f 17/04
U.S. Cl. 194—9 **5 Claims**



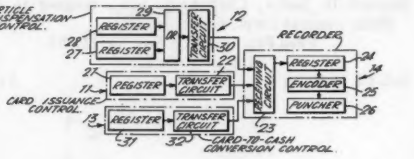
This disclosure relates to a coin-actuated golf ball testing apparatus for testing the compressibility of a golf ball. This testing apparatus has a base, a plate with a bore opening which supports a housing containing therein a resilient actuating pin which permits this actuating pin to move vertically through this bore opening in the base plate. A solenoid is mounted to the top of the base plate and in direct contact with the actuating pin. To this solenoid is mounted a locking pin which extends through a bore hole in a second plate. This locking pin is in direct contact with a cammed drum. Mounted to the cammed drum are extending brackets which support the cammed drum. The cammed drum supports means for testing the physical compressibility of a golf ball.

3,653,480

AUTOMATIC VENDING SYSTEM

Mititaka Yamamoto, and Masanori Nagata, both of Kyoto, Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Oct. 9, 1969, Ser. No. 865,082
Claims priority, application Japan, Oct. 14, 1968, 43/74886
Int. Cl. G07f 1/06
U.S. Cl. 194—4 **3 Claims**



An automatic vending system in which cards having predetermined monetary values accorded thereto are utilized to purchase an article or service. The system comprises, in combination, a card issuance control device, an article dispensation control device and a card-to-cash conversion control device. By presenting a desired amount of money to the system, the customer may obtain a card having the corresponding monetary value accorded thereto. The owner of a card may obtain an article or service by using the card in the system. When a purchase has been made, the price of the article purchased is subtracted from the monetary value the card had prior to the purchase, and the resultant new monetary value is written on the card in place of the original monetary value thereof. The owner of a card may at any time have the card converted to cash corresponding to the monetary value the card then has.

3,653,481

ELECTRICAL/ELECTRONIC COIN OR TOKEN INDENTIFICATION SYSTEM

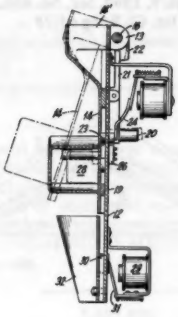
Ronald Stanley George Boxall, Bracknell, and Anthony Charles Dennes, Winnersh, both of England, assignors to Mars Incorporated, McLean, Va.

Continuation of application Ser. No. 745,500, July 17, 1968, now abandoned. This application May 11, 1970, Ser. No. 36,116
Claims priority, application Great Britain, July 17, 1967, 32,672/67; Feb. 19, 1968, 7,967/68; June 15, 1968, 28,608/68
Int. Cl. G07f 3/02
U.S. Cl. 194—100 A **34 Claims**

Two coin sensing devices are disclosed suitable for use in automatic vending machines. In both devices a coin is subjected to two separate tests and only if both of these tests are passed is the coin accepted.

In the first of these devices a coin is caused to roll down a slope passing in succession two photoelectric sensors. A portion of the pathway between the two sensors lies in a magnetic field in which the coin is subjected to eddy current braking forces characteristic of the resistivity of the coin and, hence, the material of which it is made. The time taken to pass between the two sensors is measured as the first test. Measurement is also made of the time for which the second of these photoelectric sensors is occluded by the coin. This, the second test measures a quantity dependent on the diameter of the coin. Both measurements are compared electronically with predetermined standard results for acceptable coins. If both of these tests are passed the coin is recorded electronically in a totaliser and passed to an accepted-coin receptacle.

In the second of these devices, a coin is rolled down a slope through a magnetic field which causes eddy current braking of the coin. A portion of the slope is interrupted by a trap through which the coin, if acceptable, will fall. A plastic coin will not be subjected to eddy current braking and will pass over the trap and continue down the slope and be rejected. The coin that falls through the trap passes a photoelectric sensor and impinges on a transducer. The time taken to fall past the photoelectric sensor is measured and is



the subject of the first test. The impact of the coin on the transducer causes deflection of a moving part and this deflection which is dependent on the momentum of the coin, is measured. This measurement is used in the second test. In the two tests the measurements are compared electronically with predetermined standard results for acceptable coins.

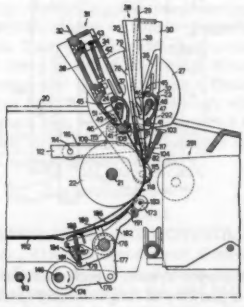
An electronic circuit is disclosed whereby the device can be programmed to examine and totalize three different denominations of coins.

3,653,482

FRONT FEEDING DEVICE FOR AN ACCOUNTING OR LIKE MACHINE

Alessandro Cortona, Banchette, and Piero Musso, Ivrea, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Feb. 26, 1969, Ser. No. 802,494
Claims priority, application Italy, Mar. 1, 1968, 50726-A/68
Int. Cl. B41j *11/48*
U.S. Cl. 197—128 **9 Claims**



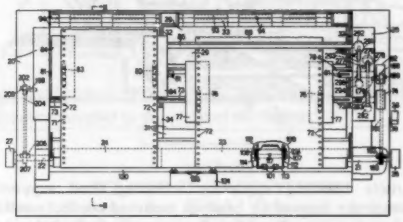
A front feeding device for an accounting or like machine having a platen, the device including a plurality of paper-pressing rollers for clamping paper to the underside of the platen, clamping means for clamping paper above the platen, and operating means for selectively opening and closing the rollers and clamping means.

3,653,483

PAPER FEED SYSTEM FOR ACCOUNTING MACHINES

Alessandro Cortona, and Piero Musso, both of Torino, Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Jan. 16, 1969, Ser. No. 791,666
Claims priority, application Italy, Jan. 18, 1968, 50170 A/68
Int. Cl. B41j *15/18*
U.S. Cl. 197—129 **13 Claims**



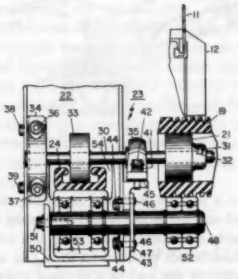
A paper feed system for an accounting machine or the like which includes a main platen and an independent platen over which continuous forms are fed by a line feed mechanism and journal sheets are fed by a form feed mechanism. The line feed and form feed mechanisms are selectively driven from a common shaft through corresponding clutch mechanisms. The common shaft is selectively driven from a continuously rotating motor shaft through a selectively actuated clutch. The engagement of the clutches is controlled by a programmed operating device.

3,653,484

HANDRAIL DRIVING ASSEMBLY FOR BELT TYPE MOVING PASSENGER CONVEYORS

Alastair Charles Taylor, Long Island, N.Y., assignor to Otis Elevator Company, New York, N.Y.

Filed Mar. 3, 1971, Ser. No. 120,603
Int. Cl. B66b *9/14*
U.S. Cl. 198—16 R **8 Claims**



A handrail driving assembly for belt type moving passenger conveyors in which a plurality of traction providing rollers are disposed along the length of the conveyor to operate independently of each other, each deriving its motive power from the motion of the belt.

3,653,485

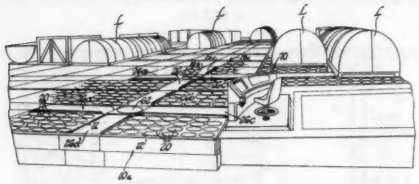
AN AIR BEARING CONVEYOR

Richard H. Donlon, Troy, Mich., assignor to Transportation Technology, Inc., Madison Heights, Mich.

Continuation-in-part of application Ser. No. 778,546, Nov. 25, 1968, now abandoned. This application Mar. 5, 1971, Ser. No. 121,605

Int. Cl. B65g *1/04*

U.S. Cl. 198—25 7 Claims



Article handling apparatus including load supporting means in the form of air bearings mounted on decks and actuable to provide a film of air for supporting a load above the surface of the decks. Propulsion means, which may be in the form of conveyor belts, are associated with one or more of the decks and have extended and retracted positions respectively engageable with, and spaced from, a load supported above the surface of the decks on the film of air. The propulsion means may be actuable to an extended position in response to energization of the air bearings so that the path of movement of the load can be determined by energization of a particular group of air bearings, and the direction of movement along the path can then be determined by energization of the propulsion means.

3,653,486

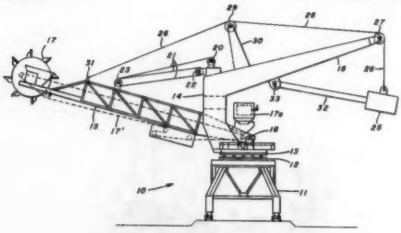
MATERIAL HANDLING APPARATUS

William B. McLean, Moon Township, Allegheny, and Laimons Naruns, Pittsburgh, both of Pa., assignors to Dravo Corporation, Pittsburgh, Pa.

Filed July 17, 1970, Ser. No. 55,889

Int. Cl. B66c *23/72*

U.S. Cl. 198—36 7 Claims



There is shown a mobile material handling structure, such as a bucket wheel stacker and reclaimer having a carriage on which is a turntable structure comprising the turntable itself, with a mast, a load boom pivoted to swing in a vertical arc, and a counterweight at the end of a pivoted strut that extends out beyond the turntable in a direction diametrically opposite the load boom. A cable, connected with the counterweight, passes over the mast and is attached to the boom, so that as the boom swings up or down from a level position, the pivoted strut with its counterweight swings in an opposite direction from a level position. The center of mass of the counterweight is roughly about as far from the center of rotation of the table as the center of mass of the load boom so that the moment arms through which the two masses are effective to counterbalance each other are approximately equal at all times.

3,653,487

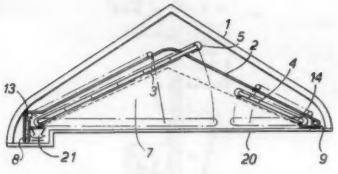
SHED SERVICE SCRAPER

Heinz Berthold, Rohrbach (Saar); Kurt Kamm, Hassel (Saar), and Wolfgang Forster, Saarbrucken, all of Germany, assignors to Pohlig-Heckel-Bleichert Vereinigte Maschimenfabriken A.G.

Filed Sept. 9, 1969, Ser. No. 856,341

Int. Cl. B65g *65/28*

U.S. Cl. 198—36 7 Claims



A shed service scraper including a travelling gantry and a main scraper chain and an auxiliary scraper chain mounted thereon the scraper chains being adapted to be driven in opposite directions so that the auxiliary scraper chain conveys loosened materials to the working region of the main scraper chain.

3,653,488

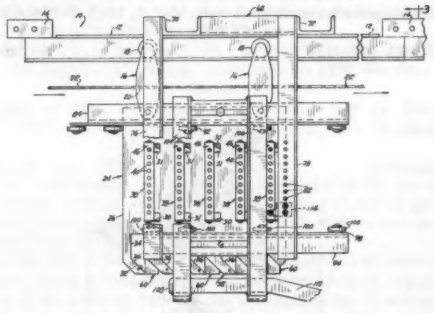
TROLLEY CONVEYOR SYSTEM AND DISPATCH STATION

George L. Witt, Oxford, Mich., assignor to My-T-Veyor Corporation, Oxford, Mich.

Filed Nov. 23, 1970, Ser. No. 91,838

Int. Cl. B65g *17/20*

U.S. Cl. 198—38 5 Claims

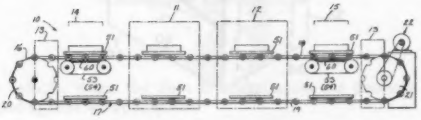


A trolley conveyor system which includes an elongated trackway and a plurality of longitudinally spaced trolley conveyors movably mounted thereon, and which includes a dumping system by which hangers removably mounted upon a plurality of pendent plates suspended from the trolley conveyors are automatically disengaged from the pendent plates as the corresponding trolley conveyors by which the plates are suspended move through the dumping station to effect an automatic unload.

3,653,489
POWER CONVEYOR SYSTEM FOR PRODUCTION LINES

Lyell C. Tullis, Janesville, and Richard G. Moon, Beloit, both of Wis., assignors to Giddings & Lewis, Inc., Fond du Lac, Wis.

Filed Dec. 22, 1969, Ser. No. 887,128
Int. Cl. B65g *21/12, 15/00*
U.S. Cl. 198—110 1 Claim

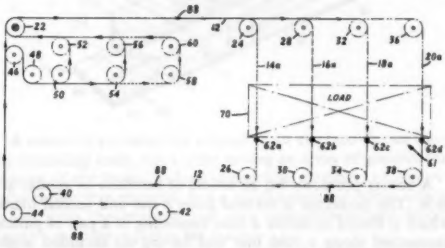


A continuously moving power conveyor for transferring work-holding fixtures through a series of work performing stations in which the conveyor supports the fixtures so as to provide for cyclic or interrupted movement of the fixtures through some stations while providing positive and continuous feed of the fixtures through at least one of the stations or manual work areas.

3,653,490
BOUSTROPHEDONIC TRANSPORT DEVICE

Alfonso DePietro, Valhalla, and Guenther L. Kuehl, Peekskill, both of N.Y., assignors to Guenther Systems, Inc., Buckanan, N.Y.

Filed Jan. 2, 1970, Ser. No. 112
Int. Cl. B65g *17/04*
U.S. Cl. 198—153 6 Claims



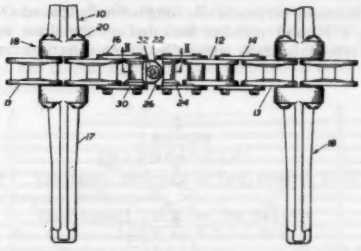
A transport device in which a plurality of flexible support members of equal length form closed loops and are adapted to move about a plurality of guides in a circulatory manner. Corresponding flexible support members are arranged in pairs and are connected by a platform device on which a load can be carried. The guides are arranged so that the platform and the load move in a first horizontal direction, then in a vertical direction, and then in a second horizontal direction opposite to the first. A magazine through which the flexible support members pass reverses the order of the components of the platform device to compensate for the effect of the guides which control vertical motion.

3,653,491
CONVEYOR CHAIN AND CONTROL METHOD

John Safko, Jr., 419 McLelland Road, Canonsburg, Pa., and Glenn S. McDowell, 601 Wylie Avenue, Franklin, Pa.

Continuation of application Ser. No. 684,166, Nov. 20, 1967, now abandoned , which is a continuation of application Ser. No. 670,360, Sept. 25, 1967, now abandoned. This application Aug. 19, 1970, Ser. No. 65,269
Int. Cl. B65g *19/00*
U.S. Cl. 198—171 6 Claims

A flight conveyor chain having plurality of links between flight sections, such links being flexible in a direction normal to the plane of the flights, and the chain having a universal

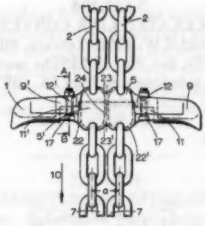


link intermediate of the flight sections which is flexible in the direction parallel to the plane of the flights.

3,653,492
SCRAPER CHAIN CONVEYORS

Helmut Temme, Im Eickel, Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Wethman near Lunen, Westfalia, Germany

Filed Jan. 7, 1971, Ser. No. 104,616
Claims priority, application Germany, June 27, 1970, P 20 31 874.5
Int. Cl. B65g *19/24*
U.S. Cl. 198—175 9 Claims



A scraper chain conveyor with an assembly composed of two centrally disposed chains interconnected at intervals with scraper elements and locking brackets. Each scraper element is tapered in cross-section and has a recess through which the chains extend and the underside of the central portion of the element overlying the recess has shaped compartments receiving horizontal links of the chains and depending lugs extending through these links. The lateral ends of the recess are bounded by apertured webs which mate with apertured end portions of the associated bracket which is disposed beneath the chains. The end portions of the bracket are offset in relation to the remainder of the bracket and have recessed parts which accommodate the heads of the connecting bolts extending through the apertures so as to prevent rotation of the bolts.

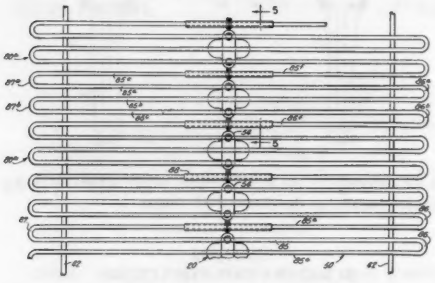
3,653,493
CONVEYOR APPARATUS

Douglas M. Kerr, Richardson, Tex., assignor to Stewart Engineering Equipment Company, Inc., Richardson, Tex.

Filed June 1, 1970, Ser. No. 42,346
Int. Cl. B65g *17/00, 15/00*
U.S. Cl. 198—189 9 Claims

A conveyor apparatus having an endless conveyor which includes an elongate draw member or chain articulated for pivotal movement about mutually perpendicular longitudinally spaced axes so that the conveyor may in its closed

path of movement change direction about both vertical and horizontal axes. A conveyor having a central longitudinal draw member or chain articulated for pivotal movement about mutually perpendicular longitudinally spaced axes and having a support member mounted on the draw member which extends laterally outwardly in both directions from the



draw member in a convoluted or zig zag manner, the support member being connected to the draw member at longitudinally spaced locations by means permitting pivotal movements of intermediate alternate parallel portions of the support member which extend perpendicularly and horizontally relative toe the draw member about longitudinally spaced perpendicular axes.

3,653,494

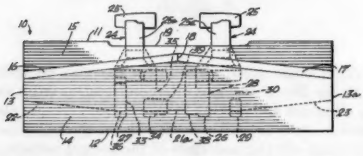
ARTICULATED LINK CONVEYOR

Eldon S. Miller, 6645 S.W. 129th Terrace, Miami, Fla.

Filed May 14, 1970, Ser. No. 37,155The portion of the term of the patent subsequent to May 26, 1987, has been disclaimed.

Int. Cl. B65g *15/30*

U.S. Cl. 198—195 **1 Claim**



A conveyor of like, individual, flat-top articulated links is described wherein the articulating mechanism permits angular movements in a common plane and wherein the individual links are downwardly stepped at a top front surface portion and upwardly stepped at a bottom rear surface portion to provide for nesting interfitting of top and bottom surface portions of successive links permitting fanning out in a common plane without mutual separation while at the same time presenting link supper surface support portions lying in a common plane.

3,653,495

SHIPPING AND DISPLAY CONTAINER

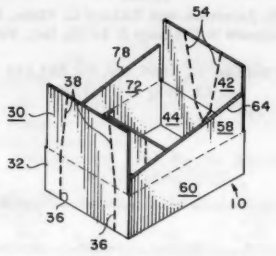
Laverne E. Gray, Dallas, Tex., assignor to Lone Star Container Corporation, Dallas, Tex.

Filed Sept. 25, 1970, Ser. No. 75,549

Int. Cl. B65d *81/36*

U.S. Cl. 206—45.12 **27 Claims**

A shipping container or carton having weakened portions which allow the container to divide into two display tray portions to display the plurality of articles therein.



3,653,496

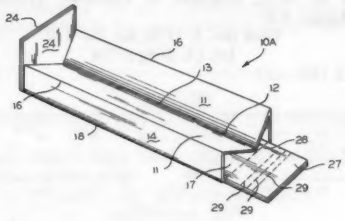
FILLER FOR POLYGONAL SHAPED ARTICLES

James E. Roberts; Ralph E. Barrow, and Robert B. Dickerson, all of Winston Salem, N.C., assignors to Container Corporation of America, Chicago, Ill.

Filed Feb. 9, 1970, Ser. No. 9,830

Int. Cl. B65d *85/64, 85/68, 5/58*

U.S. Cl. 206—46 FN **4 Claims**



A corner protector for an article of furniture or similar article. The protector is formed from a cut and scored blank which is folded to define a tube consisting of a pair of panels connected along a fold line and having an included angle which can vary according to the corner angle of the article of furniture. A panel extends from distal portions of each of said panels and laterally of the sides of the article, each of said panels being connected to flanking panels folded into facing relationship and having end flaps thereof folded over and under the furniture article. The ends of certain of the panels have flaps folded back upon the same to give extra thickness to the protector at the lower and upper ends of the article as desired.

3,653,497

SHRINK-ON PACKAGING FOR MOTOR VEHICLES

Herbert Hornstein, Viersen, Germany, assignor to Feldmuhle Aktiengesellschaft, Dusseldorf-Oberkassel, Germany

Filed May 6, 1970, Ser. No. 35,083

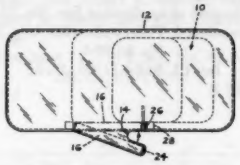
Claims priority, application Germany, May 12, 1969, P 19 24 079.0

Int. Cl. B65d *75/00;* **B65b** *53/02*

U.S. Cl. 206—46 M **7 Claims**

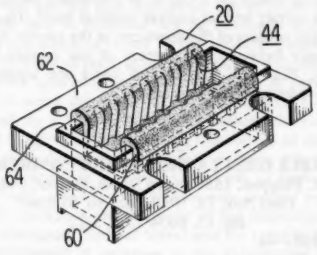
A shrink-on plastic foil package for protection of motor vehicles in transit or storage. The shrunk-on package envelops the motor vehicle on all sides and a non-shrunk fold of foil extends into the car's interior between the driver's door and the door frame to allow this door to be opened and closed to a degree without damaging the outer shrunk-on

package. When the fold is slit the door can be completely opened and closed allowing access to the steering wheel of



the vehicle. When the door is closed again the package is sealed against the atmosphere.

3,653,498
STATIC CHARGE PROTECTIVE PACKAGES FOR ELECTRON DEVICES
Thaddeus William Kisor, Flemington, N.J., assignor to RCA Corporation, New York, N.Y.
Filed Dec. 24, 1970, Ser. No. 101,316
Int. Cl. B65d *85/00*
U.S. Cl. 206—46 H **4 Claims**

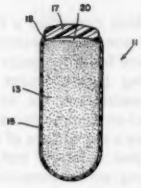


A carrier is provided for receipt of an electron device having extending leads, the carrier having an array of grooves for receipt of the leads. A lead contacting member, of electrically conductive material, has a relief pattern of ridges which extend into the grooves and into contact with the leads, thereby shorting together the leads.

3,653,499
STORAGE STABLE PARAFORMALDEHYDE STERILIZING COMPOSITION
Ferdinand Joseph Richter, Danbury, Conn., assignor to American Cyanamid Company, Stamford, Conn.
Continuation-in-part of application Ser. No. 798,542, Jan. 28, 1969, now abandoned , Continuation-in-part of application Ser. No. 636,501, May 5, 1967, now abandoned. This application Mar. 2, 1970, Ser. No. 15,448
Int. Cl. B65d *79/00;* **A61k** *27/00;* **A61l** *13/00*
U.S. Cl. 206—47 A **9 Claims**

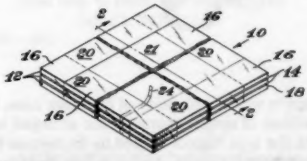
A dry two-part composition or substantially anhydrous one-part composition produces a clear, aqueous, storage stable, germicidal, sporicidal and detergent composition which prevents coagulated blood from adhering to instruments during sterilization, etc., and is used to decontaminate surgical items, such as needles and sponges. One part of the composition is paraformaldehyde having an average molecular weight of about 360 free from polymer chains over a molecular weight of 3,000. The melting point in a sealed tube does not exceed 172° C. The remainder of the composition contains an alkali metal tripolyphosphate and a water soluble buffer, such as sodium carbonate, to give a final aqueous solution having a pH between about 10 and 11. If the materials are substantially anhydrous, that is to say, free from chemically unbound water, all of the constituents can be mixed together in a powder and stored in a container hermetically sealed against the entrance of moisture. If the constituents or any of them are not substantially anhydrous, the composition must be in a two-part package separately sealed in waterproof pouches, one containing the paraformaldehyde and the other the polyphosphate and buffer.

3,653,500
FILLED CAPSULES
Howard C. Allisbaugh, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.
Filed July 11, 1969, Ser. No. 841,044
Int. Cl. B65d *79/00;* **A61k** *9/04;* **B65b** *1/00*
U.S. Cl. 206—56 AA **1 Claim**



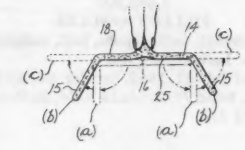
A method for making filled capsules containing dry material in which the dry material is placed into a capsule body to a level slightly below the open end of the body and a measured amount of molten gelatin is placed over the body's open end in contact with the dry material whereby upon solidification of the molten gelatin a fused joint is effected with the capsule body's open end.

3,653,501
PACKAGE OF MOISTURE-SENSITIVE METAL PLATES
Charles A. Sauer, Russellville, Ark., assignor to The Dow Chemical Company, Midland, Mich.
Filed Aug. 20, 1970, Ser. No. 65,497
Int. Cl. B65d *85/48, 85/62*
U.S. Cl. 206—62 R **6 Claims**



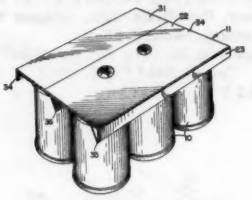
Described herein is a package of moisture-sensitive metal plates such as are used in photoengraving work. The plates have sheets of neutral interleaving material between them. The package is held together by a polymeric film barrier positioned along the edges of the superposed plates thereby to encompass all the edges. The film also serves as a moisture barrier protecting the interior surfaces of the plates from the atmosphere. The package permits moisture-sensitive plates to be shipped or stored without streaking, discoloration or other damage from "water-marking."

3,653,502
PACKAGED SURGICAL PAD HAVING PROTECTED WOUND-CONTACTING SURFACE AND METHOD OF PACKAGING SAME
John F. Beaudoin, Milwaukee, Wis., assignor to Pratt Manufacturing Corp., Milwaukee, Wis.
Filed May 11, 1970, Ser. No. 36,081
Int. Cl. A61b 15/00
U.S. Cl. 206—63.2 R 8 Claims



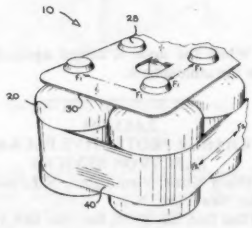
A surgical pad, which comprises a filler of cotton or the like in a covering of non-woven material, has edge portions folded downwardly and inwardly under the pad over its bottom wound-contacting face to meet on the longitudinal center line therebeneath, and is wrapped in a tubular wrapper having a peel-away top closure. When the closure is peeled away it exposes a top surface of the pad which may be grasped to lift the pad upwardly out of the package, the folded portions having an inherent tendency to thereafter straighten out into the plane of the top portion of the pad. The method of packaging the surgical pad is also disclosed.

3,653,503
CARRIER PACKAGE
Edwin L. Arneson, Hillsdale, N.J., assignor to Federal Paper Board Company, Inc., Montvale, N.J.
Continuation-in-part of application Ser. No. 815,264, Apr. 7, 1969, now abandoned. This application Jan. 13, 1970, Ser. No. 2,457
Int. Cl. B65d 71/00, 85/62
U.S. Cl. 206—65 C 11 Claims



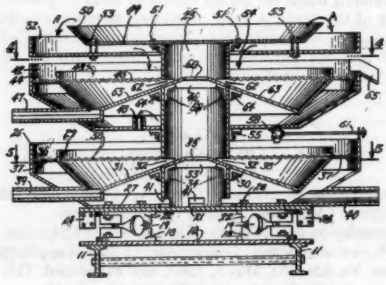
A package in which a plurality of beverage cans, bottles or other containers of similar character are arranged in row formation with the tops thereof locked to the bottom panel of a folded paperboard carrier by engaging portions of the chimes, or other projecting beads or flanges in oppositely disposed apertures arranged in spaced and paired relation along inwardly and upwardly inclined narrow side wall panels in a single row package and along like side wall panels and a narrow V-shaped center rib, in a double row package, the center rib in the latter depending from the bottom face of the carrier and disposed between the two rows of containers with small tabs cut from the material at the bottom side of each chime receiving aperture which are adapted to lie against the container wall with the top edges thereof engaging beneath the projecting chimes or other projecting means. The carrier may have finger holes or handle means permitting it to be more readily grasped for carrying the assembly.

3,653,504
CONTAINER PACKAGE
Robert W. Saumsiegle, Needham, Mass., assignor to Owens-Illinois, Inc., Toledo, Ohio
Continuation-in-part of application Ser. No. 33,333, Apr. 3, 1970, now abandoned. This application Aug. 7, 1970, Ser. No. 61,984
Int. Cl. B65d 71/00, 85/62
U.S. Cl. 206—65 E 11 Claims



Packaging device for a cluster of containers including a flat apertured carrier and an endless resilient band. The distance between the centers of the apertures in the carrier is less than the distance between the centers of the containers to be packaged. Both the carrier and band are under tension thereby producing a firm package.

3,653,505
PORTABLE ORE CLASSIFIERS AND CONDITIONERS
Arnold M. Phippen, 1550 Depeu Street, Denver, Colo.
Filed Nov. 21, 1969, Ser. No. 878,667
Int. Cl. B03b 7/00, 3/12
U.S. Cl. 209—44 8 Claims

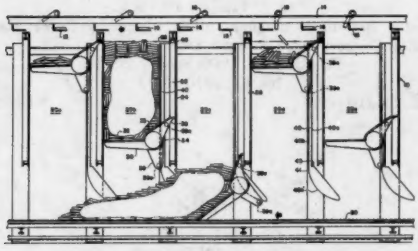


This invention is designed as an improvement over the ore classifier disclosed in prior U.S. Pat. No. 2,992,740 and employs a portable supporting structure upon which a power device and a horizontal, rotatable, top plate, from the axis of which a hollow tubular stack vertically extends, is supported. The power device constantly jogs the top plate vertically and circumferentially. A plurality of substantially similar ore concentrating pans are mounted upon and concentrically surround the stack one above the other so the jogging movements of the top plate will be simultaneously imparted to all of the pans so as to discharge light weight materials into the stack and retain the relatively heavier materials for salvage.

3,653,506
LUMBER BIN SORTER WITH VERTICALLY-POSITIONABLE AND TILTABLE BIN FLOORS

Donald B. Turner, and Albert H. Barnes, both of Portland, Oreg., assignors to Moore Dry Kiln Company of Oregon, Portland, Oreg.

Filed June 12, 1970, Ser. No. 45,819
Int. Cl. B07c *3/08*
U.S. Cl. 209—74 **3 Claims**

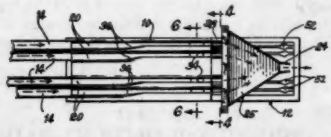


A lumber bin sorter, of the type having a multiplicity of bins to which graded green lumber is carried by an overhead conveyor and ejected into designated bin locations, wherein each of the bins is provided with a vertically positionable floor member which is raised to the topmost position when the bin is empty and then, as the bin fills up with lumber, the floor indexes successively downward until it reaches the lowest point when the bin is full. The floor, which is guided in its travel by a cam follower mechanism, thereafter tilts downward to provide an opening in the bottom of the bin for dumping its contents onto a conveyor chain traveling underneath. Appropriate sensors, in the form of limit switches and photocells, are provided to generate control signals indicating the arrival of the bin floor at the respective uppermost and lowermost pints of travel and for causing the floor to index downward in response to the progressive filling of the bin with lumber.

3,653,507
SILVERWARE SORTER

Ralph Ettlinger, Jr., Highland Park, and Frank J. Kostohryz, Elmhurst, both of Ill., assignors to Avant Industries, Inc., Wheeling, Ill.

Filed Mar. 30, 1970, Ser. No. 23,855
Int. Cl. B07b *13/04*
U.S. Cl. 209—97 **14 Claims**

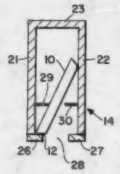


A silverware sorting construction for handling knives, forks and spoons. A bed is provided with vibrating means or other devices for moving silverware toward a discharge end of the bed. Knives on the bed are maintained in position and are discharged into collecting means located at the end of the bed. Discharge openings are defined at an intermediate location, and both forks and spoons pass through the discharge openings. A plate is positioned beneath the discharge openings, and slots are defined by the plate for receiving the forks and spoons. The slots are dimensioned so that the forks will pass through the plate into separate collecting means. The spoons are held suspended by their bowls and are moved along the plate to discharge openings at the end of the plate. A separating means may be employed for separating spoons of different size, for example separating spoons with longer handles from spoons with shorter handles. Separate collecting means are then provided for the different types of spoons.

3,653,508
APPARATUS FOR SEPARATING DEFECTIVE ARTICLES FROM ACCEPTABLE ARTICLES

Raymond G. Tessmer, Jr., Cincinnati, Ohio, assignor to The Proctor & Gamble Company, Cincinnati, Ohio

Filed Aug. 20, 1970, Ser. No. 65,455
Int. Cl. B07c *5/02*
U.S. Cl. 209—97 **8 Claims**

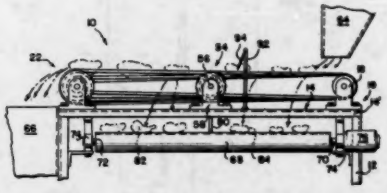


An apparatus designed to separate defective caps or like articles from acceptable caps so that only the latter are available for further processing. The apparatus includes an inclined cap chute which is fully enclosed at its upper end and which has a longitudinally slotted bottom opening at its lower end which is defined by inwardly projecting support members which may take the form of a pair of opposed ledges. Guide means which preferably take the form of a knife edge are provided projecting inwardly and spaced above the support ledges. The caps roll down the chute by gravity. Acceptable caps are supported by one of the ledges as the corresponding knife edge prevents the cap from rolling in toward the slotted bottom opening. Thus, satisfactory caps negotiate the entire length of the chute and are collected at the outlet thereof. Caps having defects are knocked out of rolling equilibrium by the guide means whereupon they fall through the slotted opening and are segregated from the acceptable caps.

3,653,509
SIZING APPARATUS

Hubert Coleman Goodman, Jr., Morgantown, W. Va., and Donald D. Hamann, Raleigh, N.C., assignors to Research Corporation, New York, N.Y.

Filed Dec. 9, 1969, Ser. No. 883,377
Int. Cl. B07b *13/04*
U.S. Cl. 209—102 **5 Claims**



Apparatus and method for sizing ovoidal bodies is provided. The sizing apparatus includes a pair of step-pulleys carried by a driven shaft with the minimum diameter pulleys thereof in opposed relation, a plurality of idler pulleys rotatably mounted on an idler shaft and conveying belts carried by each of the steps of the step-pulleys and trained about

the idler pulleys. The step-pulleys and the idler pulleys are so arranged that the belts about the idler pulleys and the step-pulleys define a V-shaped slot increasing in width from the idler pulleys to the step-pulleys. Drive means are provided for driving the conveying belts.

3,653,510

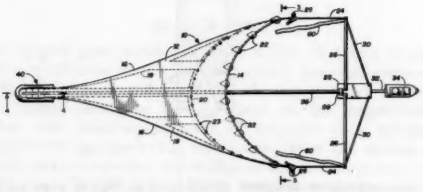
OIL SKIMMING METHOD AND APPARATUS

Hugh J. Fitzgerald, Austin, Tex., assignor to Ocean Pollution Control, Inc., Dallas, Tex.

Continuation of application Ser. No. 811,713, Apr. 1, 1969, now Patent No. 3,523,611. This application Apr. 27, 1970, Ser. No. 32,187

Int. Cl. B01d *21/00*

U.S. Cl. 210—83 **19 Claims**



Apparatus and method for skimming an oil film from the surface of a large body of water including a towed funnel assembly with a flexible cover and side skirts of impermeable sheet material with floats to keep the leading edge of the cover spaced above the surface of the water so that the oil film will pass beneath it, with the remaining portions of the cover supported on the floating oil, a bottom panel of netting to hold the side skirts in downwardly projecting position to confine the oil laterally, while permitting the water beneath it to escape freely, and a sump at the apex of the funnel to receive the oil for transfer to storage vessel.

3,653,511

SEDIMENTATION APPARATUS

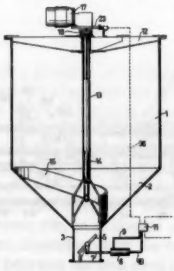
Karl Axel Goran Gustavsson, and Knut Melker Evald Tornqvist, both of Enkoping, Sweden, assignors to Aktiebolgat Bahco Ventilation, Enkoping, Sweden

Filed May 13, 1970, Ser. No. 36,787

Claims priority, application Sweden, June 12, 1969, 8381/69

Int. Cl. B01d *21/20*

U.S. Cl. 210—112 **4 Claims**



An improved sedimentation apparatus is disclosed. The sedimentation apparatus comprises a container with a lower outlet for discharging sediment and a rotating scraper for moving the sediment towards the outlet. The scraper is connected by a shaft to a drive motor resiliently mounted on the container. The drive motor is pivotally mounted relative to the shaft. When resistance to scraper movement increases because of an accumulation of a certain quantity of sediment, the motor swings in relation to the shaft and actuates means to open the outlet. When a certain quantity of the sediment is removed, the motor returns to its normal position and the outlet closes.

3,653,512

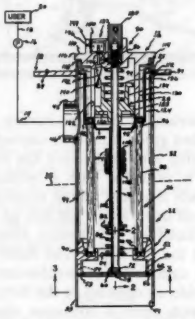
FLUID FILTER DEVICE

Carl A. Brown, Birmingham, Mich., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed July 16, 1970, Ser. No. 55,385

Int. Cl. B01d *35/28*

U.S. Cl. 210—130 **6 Claims**



A fluid filter device having an elongated tubular housing submerged in a fluid reservoir, the housing having an opening registering with the filler opening of the reservoir. The tubular housing has an inlet for receiving fluid and an outlet for discharging fluid with a fluid filter disposed therebetween. An elongated rod disposed within the tubular housing has one end threadedly engaging a cap adapted to close the open end of the tubular housing. The lower portion of the tubular housing has a pair of parallel spaced walls which form a transversely extending opening through which the lower end of the rod is disposed. The lower end of the rod has a transversely extending section which forms a T and which engages the underside of the spaced walls when rotated 90° with respect to the transversely extending opening. A spring carried by the rod biases the T section of the rod into engagement with a slot formed on the underside of the spaced walls to prevent relative rotational movement between the rod and the tubular housing when the cap is threadedly attached to the rod.

3,653,513

SWIMMING POOL FILTER APPARATUS

Robert Ortega, and Chester A. Sable, both of Orange County, Calif., assignors to Anthony Pools, Inc., South Gate, Calif.

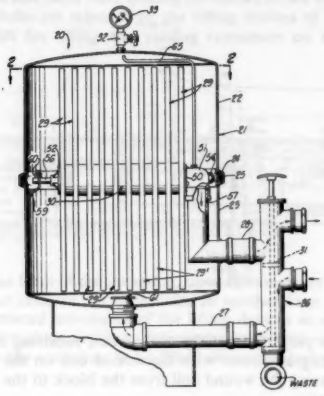
Filed Nov. 4, 1969, Ser. No. 873,969

Int. Cl. B01d *29/34*

U.S. Cl. 210—169 **2 Claims**

A plurality of generally planar filter elements are arranged in a mutually spaced stack which is mounted within a filtering chamber with the filter elements maintained planarly vertical. The stack mounting means provides resting support within the chamber while hydraulically connecting the stack externally of the chamber. Water to be filtered enters the bottom of the chamber and is spread to move along the chamber bottom and upwardly therein.

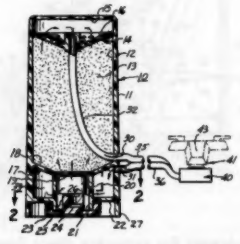
A further aspect is the construction of each filter element including a plurality of readily extending channels terminating in a central cavity. A fabric septum covers the entire grid except the cavity. Stacking is accomplished by connecting the grid elements in the region adjacent the central cavity.



3,653,514
WATER SOFTENER

Frank A. Holler, Santa Monica, and Radford G. King, Torrance, both of Calif., assignors to King-Holler International, Santa Monica, Calif.

Filed Dec. 7, 1970, Ser. No. 95,804
Int. Cl. B01d *35/02, 29/38*
U.S. Cl. 210—281 **8 Claims**

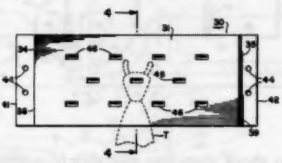


A water softener especially adapted for cosmetic use in a water supply system wherein the entire system flow is not subjected to softening. The device is intended for attachment to a faucet and includes a fluid-tight case having an internal resin chamber and an internal regenerant chamber in fluid communication with each other. A first and a second port pass through the case, one of the ports being in fluid communication with each of the chambers in such manner that water entering one of the ports must flow through both chambers to reach the other port. A removable closure gives access to the regenerant chamber so that a packet of regenerant material can be placed therein. A pair of hoses is attached to the ports, and diverter means connects the hoses to the faucet so that water may selectively be passed directly to the user without softening or may be diverted through the softener to deliver softened water. The regenerant is packed in a package, at least a portion of the cover of which is disintegrable upon contact with water, whereby a storable package may be dropped into the regenerant chamber and its contents become available for its intended purpose by the dissolution of the portion.

3,653,515
TIE RACK

George L. Rice, P.O. Box 112, R.D. #1, Temple, Pa.

Filed July 27, 1970, Ser. No. 58,495
Int. Cl. B42f *17/00*
U.S. Cl. 211—13 **4 Claims**

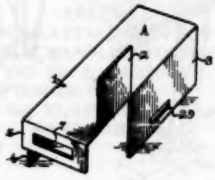


A tie rack for hook-on ties includes a casing having a front plate whose edges terminate in a rearwardly directedly flange. The rearwardly directed flange terminates with right angular ear means having openings for receiving suitable fastening devices for securing the rack to a vertical structure. The front plate has elongated slots disposed therein and arranged with their major axes in a horizontal plane. The slots are arranged in a matrix staggered in an alternate, interlaced configuration. Each slot is adapted to receive the central clip of a hook-on tie. The slots are generated through the front plate in a backwardly and downwardly directed manner so that the hook-on ties can be easily inserted into and removed from the tie rack.

3,653,516
BOOK PLATFORM STRUCTURE

Hemah J. Herbert, P.O. Box 2812, San Diego, Calif.

Filed Oct. 21, 1969, Ser. No. 868,059
Int. Cl. A47b *65/00*
U.S. Cl. 211—43 **9 Claims**



The invention described herein is to be found within an improved book platform structure which comprises a combination of useful purposes and particularly, because of its unique simplistic structure, results in a potential product that is easily manufacturable over devices which may partly possess some vaguely similar elements; thus it is therefore financially more reasonable to produce on a mass production basis and is capable of being considered practical for not only the reading room facilities of business or industrial establishments, or of places for the general public such as libraries, schools, et cetera, but also for domestic usage by the general consumer which, heretofore, has not been accomplished for a structure which is capable of performing the tasks described herein.

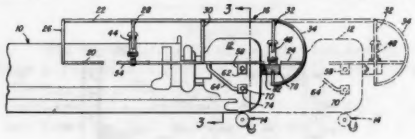
3,653,517
GUARD FOR INSULATING BOOMS

James L. Grasby, Little Rock, Ark., assignor to Saf-T-Boom Corporation, Little Rock, Ark.

Filed Dec. 7, 1970, Ser. No. 95,716
Int. Cl. B66c *15/00*
U.S. Cl. 212—1 **8 Claims**

An insulated guard particularly adapted for use on telescopic crane booms as either initial installation or conversion

equipment; the guard consisting of a skeletonized framework electrically insulated from the extensible portion of a boom and including means substantially balancing the guard at the terminal end of the boom and providing an essentially



resilient or shock absorbing assembly to minimize fracturing of the cooperating elements, and including an improved mounting assembly minimizing the fasteners in number and complexity to enable relatively unskilled labor to maintain and repair the equipment.

3,653,518

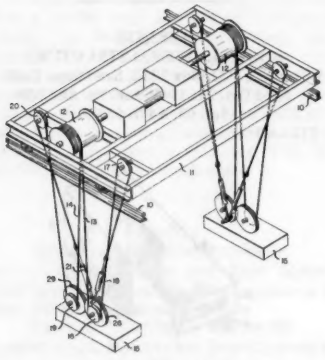
STABILIZED REEVING FOR CRANES

Karl L. Polen, Alliance, Ohio, assignor to The Alliance Machine Company

Filed Jan. 12, 1970, Ser. No. 2,256

Int. Cl. B66c *19/00*

U.S. Cl. 212—125 **5 Claims**



A stabilized reeving system is provided for crane loading and unloading wherein the load suspended from the crane may be trimmed or stabilized for tilt or list.

3,653,519

METHOD OF AND APPARATUS FOR RECEIVING A WOUND COIL

Joseph W. Jurkovac, Sr., and Donald E. Schultz, both of Waukegan, Ill., assignors to United States Steel Corporation

Filed Nov. 17, 1970, Ser. No. 90,246

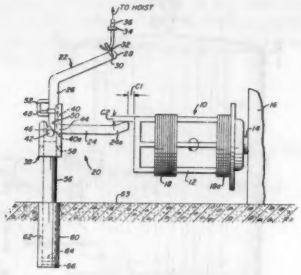
Int. Cl. A01k *97/06*

U.S. Cl. 214—1 R **18 Claims**

A method of and apparatus for receiving a wound coil from a winding device, having a rotating block on which a longitudinal member is wound into the wound coil, is disclosed.

The wound coil receiving apparatus or device has a hook provided with a toe portion and a body portion. A hook positioning member is provided with a toe portion receiving aperture adapted to receive the toe portion in projecting alignment with the wound coil so that the wound coil may be transferred from the block to the toe portion.

The method includes the steps of positioning a hook having a toe portion and a body portion in a toe portion receiving aperture of a hook positioning member so that the toe



portion projects from the toe portion receiving aperture in projecting alignment with the wound coil on the block and transferring the wound coil from the block to the positioned toe portion.

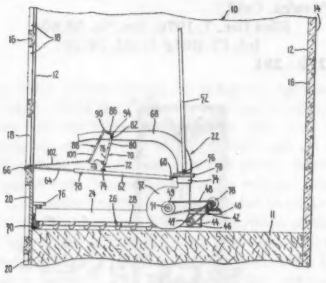
3,653,520

SILO UNLOADER DISCHARGE SPOUT AIMING SYSTEM

Erich G. Milchner, Oconto Falls, Wis., assignor to Badger Northland Inc., Kaukauna, Wis.

Filed Dec. 10, 1970, Ser. No. 96,822

U.S. Cl. 214—17 DB **4 Claims**



A silo unloader for removing silage from a silo which includes a rotatable elongated frame, a silage collecting auger, a discharge conveyor assembly with impellers to blow the silage through openings in the silo wall, a discharge spout for directing silage blown from the discharge conveyor assembly through the openings in the silo walls and a discharge spout aiming device. The aiming device includes a torque arm with one section telescopically received in a second section, a support with adjustable length pivotally attached to the torque arm and a bell crank. The bell crank is pivotally attached to the discharge spout, has one arm pivotally attached to the support and has the other arm attached to the silo wall.

3,653,521

SYSTEM AND APPARATUS FOR HOLDING FREIGHT CONTAINERS OF VEHICLES AND THE LIKE

John Bridge, 407 South Dearborn Street, Chicago, Ill.

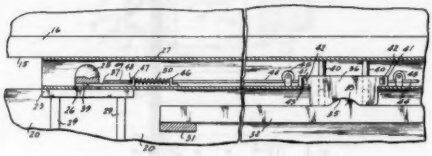
Filed Nov. 10, 1969, Ser. No. 875,477

Int. Cl. B65g *67/02*

U.S. Cl. 214—38 CA **5 Claims**

Apparatus for locating and holding freight containers to the flat deck of a vehicle, such as a railway car, truck, trailer

and the like. The containers may be of various lengths and may be intermixed on the deck of the vehicle and are located on the deck of the vehicle by interengaging dome and socket connections and latch bolts locking the domes to the sockets. The latch bolts are released by the lifting devices of a conventional lift for lifting and placing containers on vehicle



decks. In one form of the invention, upward movement of the lifting device releases the latch bolts. In another form of the invention, inward movement of the lifting devices to engage under the container, serves to release the latch bolts and accommodate the container to be lifted above the deck of the vehicle.

3,653,522

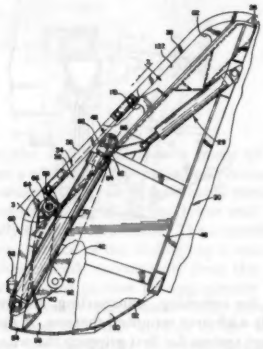
VEHICLE LOADER

Cyril R. Gollnick, Oshkosh, Wis., assignor to Leach Company, Oshkosh, Wis.

Filed June 5, 1970, Ser. No. 43,918

Int. Cl. B65f *3/00*

U.S. Cl. 214—83.3 **2 Claims**



A refuse loader including an improved mechanism for insuring proper sequential movement of a loading apparatus having a packer plate, a plate carrier, and at least one operating link and including means for pivoting, retracting, and repositioning the packer plate. The packer plate is pivotally mounted on a reciprocable carrier which, together with the plate, is adapted to be first extended and lowered for engaging loose material to be packed, whereupon the plate is swung through an arc to collect and compact the material. Thereafter the carrier and plate move together to a discharge portion of the loader. After performing the cycle, the packer plate is pivoted downwardly and returned to the original position for repetition of the cycle. The principal improvement comprises the provision of means associated with the carrier which have a predetermined resistance to sliding or reciprocable movement of the carrier in relation to the resistance to arcuate or pivotal movement of the plate, whereby, with only a single actuating means, such as a piston and cylinder assembly, and one link extending between the carrier and the pivot, operation will be carried out in the proper sequence.

3,653,523

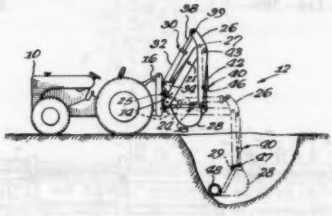
LOAD COMPENSATING HYDRAULIC CIRCUIT

Elton B. Long, Burlington; Arthur G. Short, Bettendorf, both of Iowa, assignors to J. I. Case Company, Racine, Wis.

Filed July 24, 1969, Ser. No. 844,563

Int. Cl. E02f *3/74*

U.S. Cl. 214—138 **5 Claims**



A hydraulic circuit for automatically initiating operation of a first, controlled hydraulic ram in response to the pressure build up in a second controlling hydraulic ram including a sequence control valve having an inlet port and a pressure port connected to the controlling hydraulic ram and an outlet port connected to the controlled hydraulic ram. The valve opens in direct response to the build up of pressure in the controlling ram to interconnect the inlet and outlet ports and thereby initiate operation of the controlled ram. A hydraulic valve connected in the drain line of the sequence control valve can be utilized to vary the response of the valve to operate at selected values of pressure built up in the controlling ram and may also be used to lock out the control valve.

3,653,524

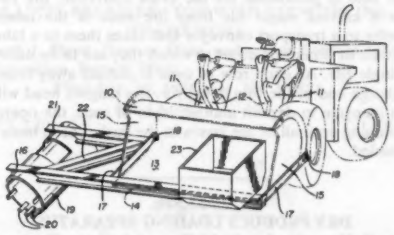
DITCH CLEANING ATTACHMENT FOR HIGH LIFT MATERIAL HANDLING EQUIPMENT

Andrew V. Rich, P.O. Box 2, and Eugene F. Zarlengo, P.O. Box 286, both of Hillsville, Pa.

Filed Aug. 21, 1970, Ser. No. 65,845

Int. Cl. E02f *3/00*

U.S. Cl. 214—145 **5 Claims**



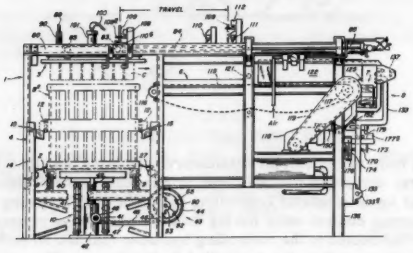
A ditch cleaning attachment for a so-called high lift shovel has an arm attachable to the bucket of the high lift and extending sidewardly therefrom and mounting a scoop on its outer end. The scoop is disposed below the arm and below the level of the bottom of the bucket and is spaced sidewardly with respect thereto where it can be manipulated by moving the bucket of the high lift shovel.

3,653,525

CONTAINER UNLOADING AND TRANSFERING APPARATUS

Albert H. Merkner; Alessandro Viecili, both of Pittsburgh, Pa., and Robert C. McCoy, deceased, late of Pittsburgh, Pa. (by Betty May Cornell McCoy, legal representative), assignors to H. J. Heinz Company, Pittsburgh, Pa., by said Merkner and said Viecili

Filed Jan. 30, 1970, Ser. No. 7,149
Int. Cl. B65g *59/02*
U.S. Cl. 214—309 **21 Claims**



The apparatus disclosed is particularly, but not exclusively, applicable for removing hot filled tins from a sterilizing basket where they are arranged in multiple layers or tiers on a vertically-movable bottom panel by raising the bottom panel in increments such that the cans of each layer in turn are pushed against a magnetic head and the basket then lowered sufficiently to leave the uppermost layer of cans suspended from the magnetic head. Said head then moves the layer of cans as a group laterally and drops them onto an endless conveyor, each layer in the basket being successively removed in this way. The conveyor carries the cans between parallel divider strips that arrange them in a plurality of lanes. Gate means are provided for simultaneously discharging the lead can in each lane onto a cross conveyor at the discharge end of the first conveyor, and when a can from each lane is positioned on the cross conveyor, the row of cans is carried single file from the ends of the lanes for transfer to a transport conveyor that takes them to a labeling machine or other apparatus to which they are to be delivered in single file. As each row of cans is carried away from the discharge end of the first conveyor, the magnet head will repeat its cycle to deposit another layer of cans, the operation continuing until all of the layers in the basket have been thus unloaded.

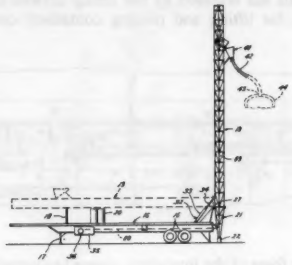
3,653,526

DRY PRODUCT LOADING APPARATUS

Alvin B. Kennedy, Jr., Alvin, Tex., assignor to Catalyst Services, Inc., Alvin, Tex.

Filed July 2, 1970, Ser. No. 51,800
Int. Cl. B65g *9/00*
U.S. Cl. 214—313 **1 Claim**

Apparatus for loading towers or other vessels with particulate dry product, for instance, catalyst material, which apparatus may be readily transported in recumbent position to the loading area and then erected for elevating the material to the vicinity of the top of the vessel to be loaded. The elevator includes a pivoted carriage in which containers of the material may be positioned and which automatically tilts, upon reaching the unloading position, to dump the material



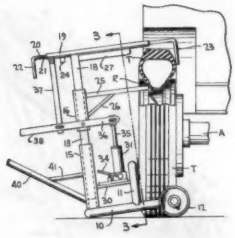
into a hopper from which it is piped to the vessel being loaded.

3,653,527

VEHICLE WHEEL DOLLY

Glenn C. Seymour, Bradford County, Pa., assignor to George R. Clapp, Burdett, N.Y., a part interest

Filed Nov. 3, 1970, Ser. No. 86,543
Int. Cl. B60b *29/00*
U.S. Cl. 214—331 **10 Claims**



A device for removing, transporting, and replacing heavy truck wheels with tires mounted thereon. A dolly is provided with a linkage system for first gripping the wheel between the wheel rim and tire periphery at the upper side of the wheel, and thereafter lifting the wheel by force applied to the gripped portion of the wheel to release it from the axle. A single power source, preferably a hydraulic ram, applies to the linkage an upward thrust to first grip and then to raise the wheel. In a modified arrangement the linkage and power source are supported on a motor vehicle to facilitate transportation of the removed wheel.

3,653,528

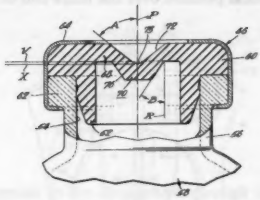
STOPPER FOR MEDICAMENT FLASKS

Hans Wimmer, Vicht, Germany, assignor to The West Company, Phoenixville, Pa.

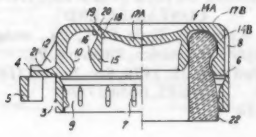
Continuation-in-part of application Ser. No. 801,914, Jan. 28, 1969, which is a continuation-in-part of application Ser. No. 697,749, Jan. 5, 1968, now abandoned. This application Mar. 3, 1970, Ser. No. 16,154
Int. Cl. B65d *41/20*
U.S. Cl. 215—38 R **9 Claims**

A stopper adapted to be held in place in an opening in a container by means of an outer cap member comprising a disc-like top portion having an enlarged outer annular wall

section and an inner radial wall section of smaller cross section than the outer wall, means defining at least one indentation in the outer surface of the top portion adapted to be pierced by a hypodermic needle or the like.



3,653,529
RINSABLE BOTTLE CAP SEAL DEVICE
Bruno Segmuller, Niederfeld, Switzerland, assignor to Segmuller AG., Stein am Rhine, Switzerland
Filed Aug. 26, 1970, Ser. No. 67,128
Claims priority, application Germany, Apr. 21, 1970, P 20 15 779.3; Switzerland, Oct. 21, 1969, 15732/69
Int. Cl. B65d *41/22*
U.S. Cl. 215—41 **7 Claims**

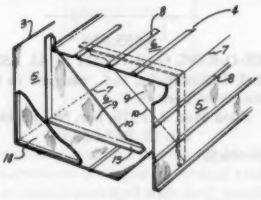


A snap-on bottle cap seal device is made of an elastic material, such as a plastic, and is formed of a reusable sealing cap and a ring-shaped safety strip detachably secured to and extending circumferentially about the lower end of the cap when it is initially secured on a bottle. The centrally disposed portion of the top surface of the sealing cap is concave and a tubular projection extends downwardly from the under side of the centrally disposed portion for engagement within the mouth of the bottle being sealed. An inwardly directed protuberance is formed on the inner surface of the skirt of the sealing cap and an outwardly directed protuberance is formed on the lower end of the tubular projection so that both protuberances provide a sealing effect against opposite surfaces of the bottle. A lifting lug is formed on the lower edge of the sealing cap and a tear-off tab, attached to the safety strap, is secured by small web sections to the lug. Passages are formed between the safety strip and the bottle and the passages extend between the lower end of the strip and grooves formed in the lower outer surface of the sealing cap. The passages are arranged to effect a rinsing of the sealing device after the bottle has been filled and sealed.

3,653,530
CLOSURE WITH REMOVAL MEANS
Hal C. Winfrey, 4160 Hawkeye Way, De Kalb County, near Stone Mountain, Ga.
Filed June 12, 1970, Ser. No. 45,794
Int. Cl. B65d *41/04*
U.S. Cl. 215—43 **9 Claims**

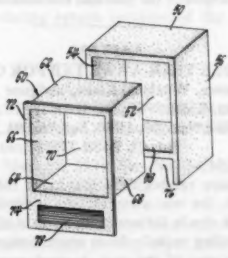
A closure cap which may be used on a fingernail polish bottle or glue tube, and which may be made as by molding in conventional form from plastic material, has a transverse tunnel in which is inserted a small metal rod or shaft so that when grasped in the fingers a twist or torque may be applied to the cap to exert considerable force to remove stuck caps. The cap may be one or two-piece, solid or hollow, with the upper part carrying and concealing the rod normally inserted into an opening in the bottom part of the cap for concealment but easily removed to insert into the transverse tunnel; or the shaft or rod may be a separate member left in the transverse tunnel, separate therefrom or suspended by a cord.

3,653,531
STORAGE TANK
Robert C. Zurmuehlen, Jennings, Mo., assignor to American Air Filter Company, Inc., Louisville, Ky.
Filed June 18, 1970, Ser. No. 47,217
Int. Cl. B65d *25/04*, *7/02*
U.S. Cl. 220—5 A **4 Claims**



A storage tank including opposed anti-slosh baffle means extending normally from the inner walls thereof to form a diagonally extending flow-through slot therebetween, the anti-slosh baffle means further serving as structural strengthening members for the tank.

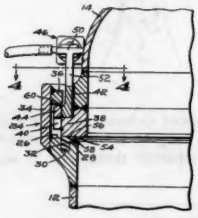
3,653,532
PLASTIC REFRIGERATOR WITH REINFORCING FRAMEWORK
Leonard J. Mann, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Apr. 30, 1970, Ser. No. 33,226
Int. Cl. B65d *25/18*
U.S. Cl. 220—9 F **1 Claim**



In the preferred form of this refrigerator cabinet for installation in a wall, a rectangular framework supports walls of

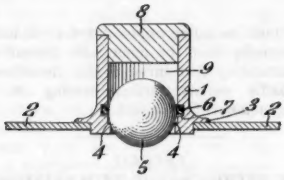
plastic foam insulation surrounding the insulated compartment. This framework is embedded in the insulation. A plastic sheet inner liner extends within and lines the insulated compartment and has outwardly extending flanges forming the front of the cabinet and hiding the foam insulation.

3,653,533
DOOR ASSEMBLY
Peder Mortensen, Skovbrynet 1, Bagsvard, Denmark
Filed Oct. 24, 1969, Ser. No. 869,169
Int. Cl. B65d *41/06*
U.S. Cl. 220—40 R **5 Claims**



A door construction for an opening in a pressure vessel, including an annular collar into which a door member is seated when in the closed position. The door member carries a rotatable locking ring having radially disposed circumferentially spaced lugs which cooperate with lugs on the collar to lock the door in the closed position.

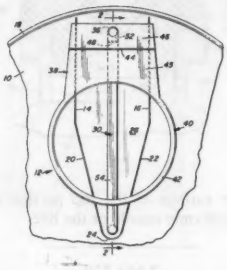
3,653,534
SPHERE-O-RING GAS-TIGHT SEAL ASSEMBLY
Alfred Barthel, Indianapolis, Ind., assignor to Union Carbide Corporation, New York, N.Y.
Filed Mar. 2, 1970, Ser. No. 15,484
Int. Cl. B65d *53/00*
U.S. Cl. 220—46 R **5 Claims**



A gas-tight seal assembly, a preferred form of which comprises a rigid tube with a rigid sphere lodged therein between a rigid annular seat which is part of the inner wall of said tube on the low pressure side of said ball, and a resilient, elastic seat on the high pressure side of said ball, such that a seal is formed between the ball and the resilient elastic seat.

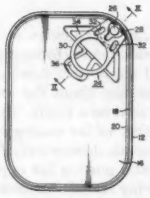
3,653,535
RETAINABLE TEAR-AWAY TAB FOR CONTAINER
Russell W. Brown, Witchita, Kans., assignor to Envir-O-Tab, Inc., Witchita, Kans.
Filed Nov. 20, 1970, Ser. No. 91,255
Int. Cl. B65d *17/24*
U.S. Cl. 220—54 **10 Claims**

This disclosure relates to a tear-away tab or closure for cans, in which, the tear-away closure is retained on the can. The top of the can is formed with a tab defined by a scored segment extending radially from approximately the center of the top to the rim of the can. A stem overlying the tab is secured to the inner end of the tab and extends along the tab towards the rim of the can. A pulling ring overlies the stem and is secured to the outer end of the stem. The can is opened by lifting the ring upwardly and pulling the stem to a generally vertical position over the inner end of the tab, then



forcing the stem and ring downwardly so that the tab will break away from the can top along the scored edges to form the opening in the can. The outer end of the tab is not scored, and thus remains attached to the top when the can is opened.

3,653,536
EASY OPENING DEVICE FOR A RECTANGULAR CONTAINER END
Howard Dale Schrecker, Hyde Park, Pa., assignor to Aluminum Company of America, Pittsburg, Pa.
Filed Aug. 31, 1970, Ser. No. 68,318
Int. Cl. B65d *17/24*
U.S. Cl. 220—54 **5 Claims**

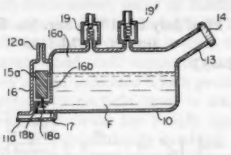


An easy opening rectangular container wall which has a line of weakness around its periphery defining a removable portion in the container wall and which has a tab attached to the removable portion in one corner, as by means of an integral rivet, and a downward embossment in the removable portion including a wing section spread outwardly from adjacent the attachment and a narrow tail section joined to the wing section.

3,653,537
FUEL TANK OF AUTOMOTIVE INTERNAL COMBUSTION ENGINE
Masaji Shiobara, and Yoshio Toda, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan
Filed Feb. 6, 1970, Ser. No. 9,365
Int. Cl. B65d *25/00*
U.S. Cl. 220—85 **4 Claims**

A fuel tank for an automotive internal combustion engine, adapted to prevent the liquid fuel from being vapourized and discharged from the breathing vent in the tank wall, which

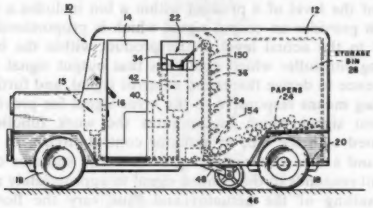
tank has a float having the coverage that is substantially coextensive with the surface of the liquid fuel that is otherwise to be exposed to the atmosphere through the breathing vent.



3,653,538
METHOD AND SYSTEM FOR DISTRIBUTION OF ARTICLES IN RESIDENTIAL AREAS

Robert L. Lamar, deceased, late of 2318 Rosefield St., Houston, Tex. (Mary Ann Carey Lamar, executrix)

Filed May 25, 1970, Ser. No. 40,212
Int. Cl. B65g *59/00*
U.S. Cl. 221—1 **17 Claims**

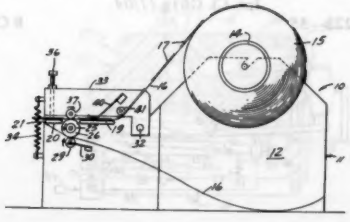


An automatic method and system for the distribution of articles, such as newspapers, in residential areas. Programmed information concerning a desired distribution route provides the input to a closed-cycle mobile article launcher. A measured quantity, related to the distance travelled by the mobile launcher from an initial reference position on the distribution route, is used to control the rate at which the programmed information is delivered to the closed-cycle firing system of the article launcher. The firing control system can operate as a closed-cycle or as an open-cycle at the command of the vehicle driver.

3,653,539
LABEL DISPENSING MECHANISM

Wilfred E. Stageberg, Minneapolis, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed Nov. 26, 1969, Ser. No. 880,193
Int. Cl. B65h *5/28*
U.S. Cl. 221—73 **12 Claims**

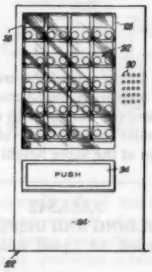


A label stock dispenser for incrementally driving a liner upon the surface of which are spaced adhesively mounted labels. The apparatus will drive the liner to successively position a label in a dispensed separated position relative to the liner, and upon the application of a force to complete the removal of the dispensed label the apparatus will automatically dispense a successive label to that position. The apparatus comprises a pair of opposed rollers, at least one of which is driven, while rollers are mounted on parallel axes and the peripheries are spaced a distance less than the thickness of the liner and the label of the label stock but greater than the thickness of the liner, thus affording a frictional drive for the label stock and discontinuance of the drive upon reaching the end of each successive label.

3,653,540
DISPENSING MACHINE HAVING MULTIPLE DUAL HELIX CONVEYORS

Elmer Bradley Offutt, Independence, Mo., assignor to The Vendo Company, Kansas City, Mo.

Filed Feb. 6, 1970, Ser. No. 9,291
Int. Cl. G07f *11/00*
U.S. Cl. 221—75 **15 Claims**



An article dispensing machine having a plurality of elongated, parallel dispensers arranged in vertical and horizontal rows ans wherein each is provided with dual, parallel, spaced, helical article-delivery conveyors having convolutions wound in opposite directions. The conveyors are adapted to be simultaneously rotated in opposite directions to successively force articles from the discharge end of a respective dispenser in response to successive operations thereof. Drive mechanism for the dispensers includes a rotatable clutch member for each dispenser provided with a shiftable actuator thereon while a selection solenoid is operably associated with each actuator for shifting the latter from standby to an operated position. In the operated position, each actuator is located to engage gear structure on an associated dispenser for rotating the dual conveyors thereof in opposite directions in response to rotation of the respective clutch member. All of the clutch members are rotated simultaneously through an operating arc and then back by cables trained therearound and coupled to a common drive assembly. An operated actuator is cammed back to standby by a stop adjacent each clutch member, during return rotation of the clutch members.

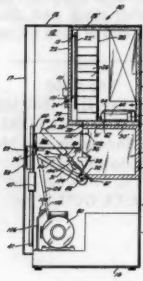
3,653,541
FOOD HEATING AND DISPENSING MACHINE

Wayne M. Crum, Anaheim, Calif., assignor to Ven-Dog International, Fullerton, Calif.

Filed Mar. 31, 1970, Ser. No. 24,305
Int. Cl. G07f *11/00*
U.S. Cl. 221—150 HC **17 Claims**

A food heating and dispensing machine including a cabinet having a refrigeration zone at the upper end thereof, the refrigeration zone enclosing a plurality of vertically disposed storage racks adapted to receive boxes containing food items such as hotdogs. Positioned immediately below the refrigera-

tion zone is a conventional microwave oven having a front door pivotable about a horizontal axis at the bottom of the oven. A plurality of pneumatic cylinders are positioned behind the storage racks so as to selectively force one of the boxes out of one of the racks, such box falling into the oven.



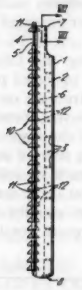
After being heated in the oven, the oven door conveys the boxed food item to a delivery bin. According to one embodiment of the invention, the delivery bin comprises an elevator which operates, under the control of the oven door, to deliver the food item at the same height as the oven door.

3,653,542

MEANS FOR HOLDING AND DISPENSING ARTICLES

Gerald Werner Russell, 65 Uphill Road, Mill Hill, London, N.W., England

Filed Feb. 18, 1969, Ser. No. 800,064
Claims priority, application Great Britain, Mar. 4, 1968, 10,420/68
Int. Cl. A47f *1/04*; G07f *11/04*
U.S. Cl. 221—307 **2 Claims**



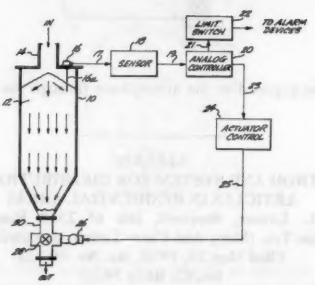
A holder with a plurality of articles arranged and captively held therein so that they can be fed in sequence to a dispensing point, the holder being formed at this dispensing point so that when an article is located there part of the article is exposed whereby this part can be secured to another article, for example by welding or adhesive, while still being positively held in the holder.

3,653,543

PROPORTIONAL BIN LEVEL AND FLOW CONTROL SYSTEM

Fritz K. Preikschat, 16020 Lake Hills Boulevard, Bellevue, Wash.

Filed July 13, 1970, Ser. No. 54,286
Int. Cl. B67d *5/08*
U.S. Cl. 222—52 **14 Claims**



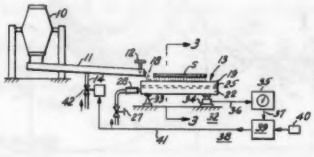
A system for providing proportional and continuous control of the level of a product within a bin includes a sensor which provides an output signal which is proportionally related to the actual level of the product within the bin, an analog controller which compares that output signal with a reference to derive therefrom an error signal, and further including means responsive to the error signal for providing a control signal which incorporates the work function associated with the bin, an actuator control circuit, an actuator, and a flow rate regulating device. The actuator control circuit responds to the control signal to appropriately modify the setting of the actuator and thus vary the flow rate established through the flow rate regulating device in a manner which returns the bin level to a desired value represented by the reference in the analog controller. The sensor may comprise a metallic rod and provide its output signal by determining the complex impedance existing between the rod and the bin wall, wherein the rod is partially immersed in the product. The flow rate regulating device may control the flat rate of discharge either into or from the bin. One such device comprises a linear pinch valve useful in regulating the flow rate of discharge from the bin which includes a conical transfer section and a three-point pinching mechanism. A general description of the analog controller and its relation to the bin's work function is given. Finally, a circuit for providing appropriate signals when the bin level reaches maximum or minimum values is disclosed.

3,653,544

PARTICLE DISPENSING APPARATUS AND METHOD

Harold K. Young; Herbert Wald; William O. Blanch, and Lacy C. Meadows, all of Baltimore, Md., assignors to Bethlehem Steel Corporation

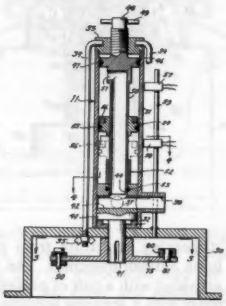
Filed May 29, 1969, Ser. No. 829,014
Int. Cl. G01g *11/04*
U.S. Cl. 222—55 **8 Claims**



Particle dispensing apparatus coats one or more surfaces of a workpiece such as a moving web, strip, sheet, plate or flat

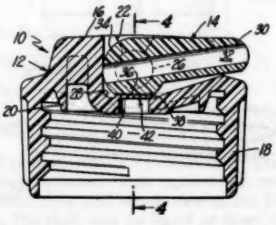
wire. Particles are fed from at least one source over fluidized conveyors to separate particle applicators associated with each surface to be coated. Each particle applicator includes a receiver-dispenser having a fluidized bed and counter-rotating brush rolls which continuously picks up fluidized particles and discharges them against one of the surfaces to be coated in an amount which varies with particle level in the receiver-dispenser. A separate load cell supports each receiver-dispenser and drives a load indicator which produces weight signals that are related to particle level in each receiver-dispenser. A controller receiving the weight signals acts on the conveyor means to independently maintain a predetermined level of particles in each receiver-dispenser. This provides a uniform application of particles on each surface of the workpiece to be coated.

3,653,545
FLUID PROPORTIONING SYSTEM
Dale Tanner, 21 Academy Avenue, Woodbury Heights, N.J.
Filed Feb. 24, 1970, Ser. No. 13,528
Int. Cl. G01f *11/44*
U.S. Cl. 222—61 **5 Claims**



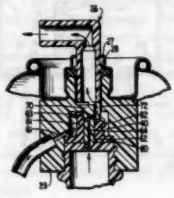
A plurality of cylinder and piston assemblies for connection on their inlet sides to respective fluid sources and on their outlet sides to a common vessel, the cylinder-and-piston assemblies each including valve means operable to communicate a selected side of the respective piston with one of the associated supply fluid and common vessel, and communicate the other piston side with the other of the supply fluid and common vessel, the valve means being interconnected for operation in predetermined relation.

3,653,546
DISPENSING CLOSURE WITH RUPTURABLE DIAPHRAGM SEAL
Robert E. Hazard, North Kingstown, R.I., assignor to Polytope Corporation, Slatersville, R.I.
Filed Mar. 23, 1970, Ser. No. 21,882
Int. Cl. B67b *7/12*
U.S. Cl. 222—83 **6 Claims**



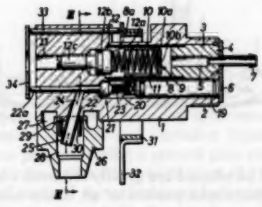
A rupturable diaphragm seal is disclosed for use in dispensing closures having a closure body including a dispensing opening leading there through and having a spout rotatably mounted on the body so as to be capable of being rotated from an initial closed position in which a passage in the spout is out of alignment with the dispensing opening to an open position in which the passage of the spout is aligned with the dispensing opening. In such a closure the rupturable diaphragm is secured to the closure body so as to extend across the opening. The spout used is formed so as to overlie the diaphragm in an initial closed position of the spout and is formed so as to engage and apply pressure to the diaphragm when the spout is rotated from this initial closed position to an open position so as to rupture the diaphragm.

3,653,547
FOUR PART, TWO FLUID DISPENSER
Leonard L. Marraffino, 1824 R.W. 36 Court, Oakland Park, Fla.
Filed Oct. 12, 1970, Ser. No. 79,805
Int. Cl. B65d *35/22*
U.S. Cl. 222—94 **5 Claims**



A four part non-metallic fluid mixing and dispensing device is provided for an aerosol can which dispenses two fluids, one of the fluids being destructive of metal. Fine ducts are provided in unique positions whereby manufacturing costs are reduced, and reliability in use and long shelf life are ensured. The location of the ducts in the combination of the four parts accomplishes these desired results.

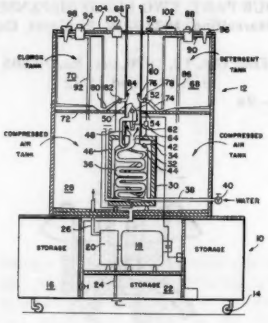
3,653,548
TAPPING COCK FOR MIXED DRINKS CONTAINING CARBONIC ACID
Hans Kotscha, Ratingen-Tiefenbroich; Karel Van Moock, and Herbert Kuhnt, both of Lintorf, all of Germany, assignors to Tornado GmbH, Lintorf, Germany
Filed Dec. 11, 1969, Ser. No. 884,259
Claims priority, application Germany, Dec. 14, 1968, P 18 14 695.7
Int. Cl. B67d *5/56*
U.S. Cl. 222—129.1 **5 Claims**



A tapping cock for mixed drinks which comprises a feeding conduit each for fruit syrup and for carbonated water. Both said conduits are disposed in a cock housing. A discharge valve is operable from the outside in each of the conduits and opening and closing, respectively, the conduits. An outlet mouth piece receives the conduits. A control valve is disposed in the cock housing between the feeding conduit

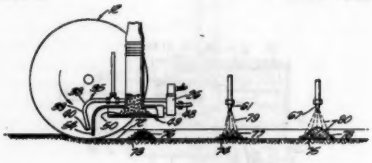
for fruit syrup and the discharge valve coordinated thereto holding constant the passing quantity thereof, independently from the pressure, temperature and viscosity, and the control valve having outlet openings disposed adjacent to the corresponding discharge valve.

3,653,549
CLEANER APPLIANCE
Charles Worth Cannon, 556 Meighan Boulevard, Gadsden, Ala.
Filed May 5, 1969, Ser. No. 821,785
Int. Cl. B05b *7/16*
U.S. Cl. 222—132 **4 Claims**



An appliance designed for simple cleaning jobs comprising various components for introducing and mixing water, air, and detergent in the form of a jet stream that is directed onto a surface to be cleaned. The appliance includes a mixing valve for air and water, means for heating the air and water, means for introducing detergent into the mixture of air and water, and various components and controls to provide a self-contained mobile unit.

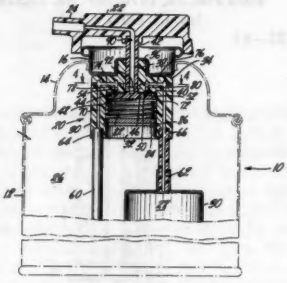
3,653,550
PLANTING METHOD AND APPARATUS
David M. Williams, Salinas, Calif., assignor to Bruce Church, Inc., Salinas, Calif.
Continuation-in-part of application Ser. No. 559,562, June 22, 1966, now Patent No. 3,467,278, dated Sept. 16, 1969. This application Jan. 30, 1969, Ser. No. 795,321
Int. Cl. B67d *5/52*
U.S. Cl. 222—136 **2 Claims**



Seeds to be planted are gravity fed from a hopper to a substantially horizontal portion of an outlet tubing. At the appropriate time a blast of pressurized air ejects a measured amount of seeds into a furrow. Simultaneously, a discrete quantity of vermiculite is gravity fed into a horizontal compartment from which it is also pneumatically ejected with the seeds to form a common mass in the furrow. Subsequently, the vermiculite-seed mass is sprayed with liquid fertilizer and then sprayed with an asphalt stabilizer. A further aspect is the provision of a plurality of such apparatus disposed transversely of the furrows with timed commutators providing planting locations of adjacent furrows in a staggered arrangement.

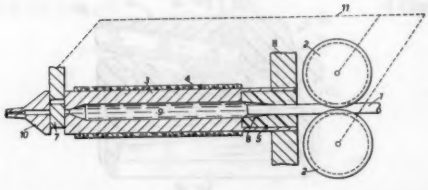
An improved vermiculite dispensing apparatus is provided for metering the discrete quantity of vermiculite which is pneumatically expelled. The dispenser comprises a vertical delivery tube and a horizontal dispensing tube which join to form a generally inverted T-shaped volumetric measuring structure. The lower rear end of the vertical delivery tube tapers inwardly and extends partially into the dispensing tube.

3,653,551
AEROSOL DISPENSER VALVE
George Peter Koch, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.
Filed Apr. 20, 1970, Ser. No. 29,797
Int. Cl. B67d *5/52*
U.S. Cl. 222—136 **8 Claims**



A valve for dispensing a mixture from plural ingredient compartments in an aerosol dispenser. The valve has a hollow main body provided with a pair of passages each communicating respectively with a separate ingredient compartment within the container. A closure element in the form of a disc and integral discharge tube is mounted slidably in the valve body and spring means normally urge the disc against the outlet openings of the passages in closure condition of the valve. By depressing the discharge tube and its connected disc, the valve is opened to allow discharge from the passages into a mixing chamber in the valve from whence the product mixture enters the discharge tube through orifices therein for discharge from the dispenser.

3,653,552
ADHESIVE APPLICATOR
Bernard Edwin Ash, Kent, England, assignor to International Standard Electric Corporation, New York, N.Y.
Filed Oct. 22, 1969, Ser. No. 868,538
Claims priority, application Great Britain, Nov. 7, 1968, 52,772/68
Int. Cl. B05c *5/02*
U.S. Cl. 222—146 HE **5 Claims**



A device for dispensing liquid resinous material from solid rods includes a heated melting tube having a dispensing jet

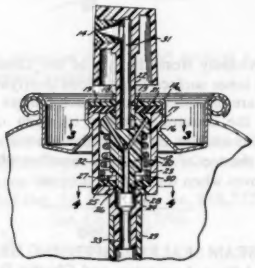
with a valve at one end, and a tapered insert at the other end made of a material to which the resinous material will not adhere. The drive feeding the rod into the insert is disengaged when the valve is closed and reengaged when the valve is opened. The arrangement prevents pressure build up when the device is stopped and limits back flow of molten material along the rod.

3,653,553

SELF-CLEANING VALVE FOR AEROSOL CONTAINERS

Samuel Benjamin Prussin, Los Angeles, and Jimmie L. Mason, Hacienda Heights, both of Calif., assignors to Dart Industries, Inc., Los Angeles, Calif.

Filed Oct. 27, 1969, Ser. No. 869,496
Int. Cl. B65d *83/14*
U.S. Cl. 222—148 **2 Claims**



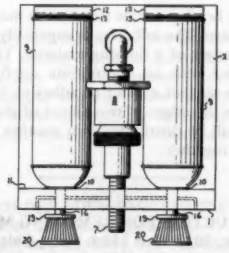
A valve is described wherein vaporous purging substance in the head space above the material to be dispensed in an aerosol container can be introduced into the valve in such quantity as to clean the valve and reduce the flow of the material to be dispensed therethrough. A method of cleaning a valve is also described.

3,653,554

DISPENSING DEVICE FOR SHOWERS AND THE LIKE

Frank W. Turben, Columbus, Pa.

Filed Oct. 27, 1970, Ser. No. 84,264
Int. Cl. B67d *5/06*
U.S. Cl. 222—181 **9 Claims**



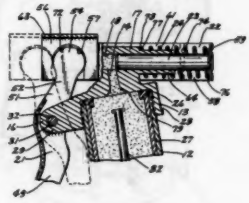
A holder for sepro or like cans of fluid under pressure having a valve member which seals against the nozzle when pushed to release fluid and which directs the fluid to the desired outlet. The fluid may be liquid or foam. One use is for showers where the fluid may be directed either to the line leading to the shower head or to an outlet adjacent the valve.

3,653,555

GREASE DISPENSING HEAD

Chester Dorn, Spencer, Iowa, assignor to Superior Manufacturing Company, Spencer, Iowa

Filed June 19, 1970, Ser. No. 47,708
Int. Cl. G01f *11/00*
U.S. Cl. 222—256 **11 Claims**



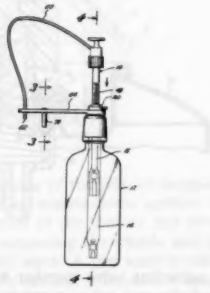
A grease dispensing head for a miniaturized hand grease gun is provided herein. The grease dispensing head comprises a cylindrical cap having a passage formed upwardly therethrough. A cylinder is transversely mounted on the cap and has a bore formed therethrough which is valved at the forward end and which communicates with the passage. A saddle straddles the cylinder and has a piston secured to the rearward portion; the piston extending forwardly into the bore. The saddle is reciprocated by an actuating handle rotatably secured to the cap and to the forward portion of the saddle. A spring normally retains the piston in said bore rearwardly of the passage.

3,653,556

LIQUID DISPENSING APPARATUS

John J. Moran, and Robert C. Querry, both of Houston, Tex., assignors to Hycel, Inc., Houston, Tex.

Filed Jan. 5, 1970, Ser. No. 700
Int. Cl. G01f *11/06*
U.S. Cl. 222—309 **2 Claims**



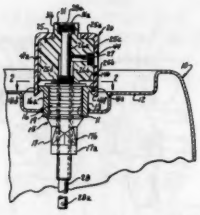
A manually operated liquid dispensing apparatus for use in dispensing chemical reagents and corrosive liquids from a container. A glass plunger having a ground glass piston slidable in a glass cylinder and a flat ground glass check valve in the lower end of each of the cylinder and plunger whereby corrosive liquids can be admitted into the cylinder and discharged through the plunger. The plunger having calibration means and an adjustable stop for dispensing a measured amount of liquid therefrom. A flexible outlet hose connected to the plunger outlet and a hose support adapted to be connected to the apparatus and including a hose holding means and also including means for closing the end of the hose for eliminating drippage and evaporation.

3,653,557

KEG SEALING AND TAPPING APPARATUS

Kay R. Lamb, 1105 Ridge Avenue, Rockford, Ill.

Filed Apr. 20, 1970, Ser. No. 30,000
Int. Cl. B65d *83/00*; **B67d** *5/54*
U.S. Cl. 222—400.7 **8 Claims**



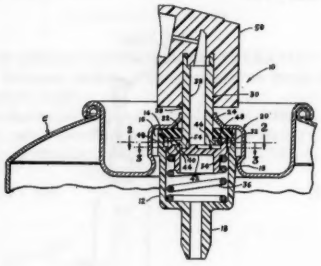
An apparatus for sealing and tapping containers for pressurized liquids such as beer kegs and the like including a resilient valve plug mounted in the tap hole of a keg and tap head removably mounted on the keg having an inner liquid delivery tube and an outer fluid supply tube extending downwardly through the valve plug into the keg to allow pressurized fluid to be supplied to the keg through the fluid supply tube and liquid to be withdrawn from the keg through the liquid delivery tube. The plug has integral valve means arranged to seal against the outer fluid supply tube when the head is mounted on the container, and which is adapted to close and seal the container when the head is removed.

3,653,558

AEROSOL VALVE HAVING SELECTABLE SPRAY RATE

Joseph John Shay, Manchester, N.H., assignor to Scovil Manufacturing Company, Waterbury, Conn.

Filed Oct. 15, 1970, Ser. No. 81,024
Int. Cl. B65d *83/00*
U.S. Cl. 222—402.17 **6 Claims**



Aerosol valve has valve member having, aside from the conventional rim seal valve, a rotary valve comprising two parts of the valve member to control flow. Turning the valve steam makes the adjustment.

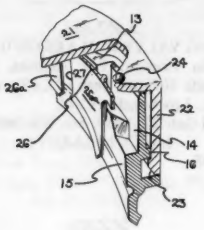
3,653,559

DISPENSING CONTAINER AND CLOSURE

James R. Dreps, Kinnelon, and Ira H. Miller, West New York, both of N.J., assignors to Owens-Illinois, Inc.

Continuation of application Ser. No. 737,018, June 14, 1968, now abandoned. This application May 1, 1970, Ser. No. 31,869
Int. Cl. B65d *47/00*
U.S. Cl. 222—545 **13 Claims**

A two-piece dispensing package is provided in which one of the parts functions as the container for retaining the product and the other part cooperates therewith to function alternately as a closure and as a dispenser. The container has a finish contoured to receive the one-piece closure member which is rotatable thereon between a closed sealing position and an open dispensing position. Vertical grooves are formed on the inner surface of the container neck. Sealing flanges



extend downwardly from the top of the closure and snugly engage such inner surface in positions overlying the grooves. Cam means are provided to force such flanges inwardly upon rotation of the closure member to open communication between the container body and the grooves. Apertures are provided in the top of the closure member which overlie the vertical grooves when the closure is open.

3,653,560

SEAM SEALER DISPENSING HEAD

William H. Adams, Lancaster, and Charles D. Painter, Holtwood, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Mar. 2, 1970, Ser. No. 15,557
Int. Cl. B05c *5/02*
U.S. Cl. 222—566 **1 Claim**

A dispensing head or nozzle structure is mounted on a container of adhesive. The adhesive is especially adapted to adhere together edges of a flooring material. The nozzle structure is provided with an appropriate configuration and a guide structure so that a bead of adhesive is properly positioned between the edges of two pieces of sheet flooring and the adhesive will be distributed in a manner to properly adhere the edges together.

3,653,561

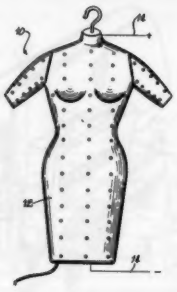
CONSTRUCTION FOR REMOVING MOISTURE

Rhea V. Shields, 2032 West 110th Place, Chicago, Ill.

Filed May 27, 1970, Ser. No. 40,963
Int. Cl. A41h *5/00*; **D06f** *59/00*
U.S. Cl. 223—70 **4 Claims**

A construction for removing moisture from clothes and the like comprising a form which includes at least one sheet of electrically conductive material. Electrical terminals are attached to the sheet whereby current can be passed through the sheet for purposes of raising the surface temperature of the form. The form is dimensioned so that an article of

clothing can be fit around the form for contact with the heated surface. This will provide for removal of moisture



which may be water or other liquid such as a dry cleaning fluid or mixtures of various fluids.

3,653,562

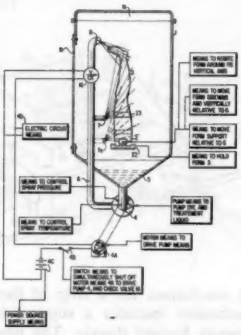
STOCKING PROCESSING APPARATUS

Curt H. Kronsbein, Hagen-Boelerheide, Germany, assignor to Eugen Bellmann GmbH

Filed Oct. 23, 1969, Ser. No. 868,737

Int. Cl. D06c *5/00*

U.S. Cl. 223—76 **8 Claims**



Stretch hosiery articles and the like are mounted on a support form, and dyeing liquid is sprayed against the form through a plurality of spray means. The spray jets are oriented to minimize shifting of the hosiery articles on the form, spraying liquid in opposing directions to the portions most likely to shift. Special spray drums are provided.

3,653,563

WIG HOLDER WITH ADJUSTABLE CLAMP

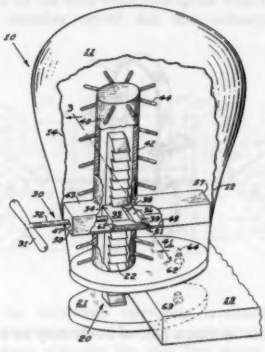
John E. Russ, R.R. 10, Bloomington, Ind.

Filed Oct. 22, 1970, Ser. No. 83,122

Int. Cl. D06c *15/00;* **D06f** *59/00;* **A41h** *5/00*

U.S. Cl. 223—66 **5 Claims**

A wig holder for mounting on a table and in a wig box. The holder simulates a head and neck and has a plastic housing assembly secured to it which slidingly receives a rack assembly and a plunger assembly. The housing assembly has a vertically extending tube integrally joined to a horizontally extending tube. A top plate is secured to the bottom of the vertical tube. A rack is mounted on top of a bottom plate, and is positioned in the vertically extending tube. A plunger is slidable in the horizontal tube, engaging and locking the



rack in position. A handled rod is mounted to the plunger. A hole is provided through the top and bottom plates for mounting the holder in a wig box.

3,653,564

GUN SLING AND METHOD OF USE

Sidney Albert Carter, 28 Club House Road, Santa Cruz, Calif.

Filed Nov. 14, 1969, Ser. No. 876,785

Int. Cl. F41c *33/00*

U.S. Cl. 224—1 A **9 Claims**

A gun sling for firearms of the rifle or shotgun type. The firearm is supported in muzzle-down position by a sling passing around the body of the shooter and attached at its lower end to a cup supporting the muzzle and at its upper end to a portion of the stock. A gun worn in this position is easily and comfortably carried, protects the muzzle against damage and entry of foreign matter, and the supporting cup quickly drops away by gravity upon slackening of the sling to allow the gun to be rapidly brought into firing position.

3,653,565

ROOT HOLDER

Robert R. McAusland, Seattle, Wash., assignor to Anderson & Thompson Ski Co., Inc., Seattle, Wash.

Filed Nov. 5, 1970, Ser. No. 87,231

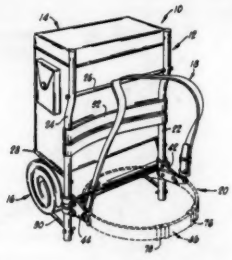
Int. Cl. B65d *63/00*

U.S. Cl. 224—5 R **5 Claims**

Rigid hoops are secured inboard of the ends of an elongated strap and elastic loops are secured at the ends. A relatively stiff portion of the strap separates each rigid hoop from the corresponding loop. The toe of a boot is placed in each

rigid hoop, the relatively stiff portion of the strap is placed against the sole of the boot and the loop stretched over the heel of the boot so that a pair of boots may be held securely on the strap.

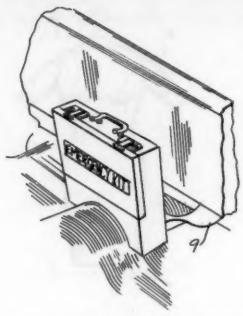
3,653,566
PACK FRAME ASSEMBLY
Jimmie L. Owens, 4426 Kaller Drive, Wichita, Kans.
Continuation-in-part of application Ser. No. 811,974, Apr. 1, 1969, now Patent No. 3,581,961, dated June 1, 1971. This application June 15, 1970, Ser. No. 46,110
Int. Cl. A45f *3/08*
U.S. Cl. 224—25 A **2 Claims**



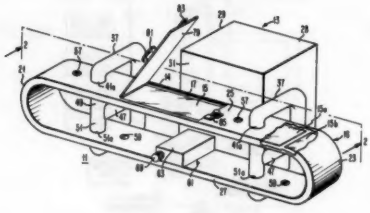
This invention is an improved pack frame assembly adapted for mounting on a person's body to carry objects thereon. More particularly, this invention has an adjustable hip engaging means mounted with the normally upright support members of the pack frame and operable to transfer a substantial portion of the load to the wearer's hips, and a shoulder strap means connected with the pack frame and adjustably connectable with the hip engaging means.

3,653,567
PORTABLE KIT
Peter M. Selvaggio, 3965 Robertann Drive, Kettering, Ohio
Filed Feb. 11, 1970, Ser. No. 10,355
Int. Cl. B60m *1/00*
U.S. Cl. 224—42.42 R **1 Claim**

The present invention relates to a portable kit having an outer shell shaped for mounting on the drive shaft hump of the floor of a motor vehicle. A concave section is formed within the outer shell of said portable kit. A side lid is provided on the side of the kit, above the concave section of the kit. Tie down belt holders are provided on the bottom of the kit in order to further hold the kit within the motor vehicle.



3,653,568
TAPE TRANSPORT MECHANISM
Donald H. Cronquist, Los Gatos, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed July 2, 1970, Ser. No. 51,926
Int. Cl. B65h *17/32*
U.S. Cl. 226—97 **4 Claims**

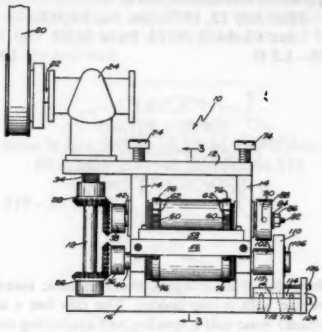


A transport mechanism for a strip of flexible recording tape. The mechanism includes a support having a loop-shaped passageway formed therein. The passageway has a predetermined length and is structured to receive an elongated discontinuous strip of flexible tape having a length slightly less than the median length of the passageway. When the strip of tape is placed in the passageway, the free ends of the strip are closely adjacent to each other. A pneumatic driving force is applied to this tape strip to operate it within the passageway. The tape strip moves through the passageway in a manner very similar to a continuous tape loop.

3,653,569
ADJUSTABLE ROLL FEED
Robert H. Homstead, Greenville; Carl G. Peterson, Esmond, and Anthony Gomez, Warwick, all of R.I., assignors to Carl G. Peterson Co., Smithfield, R.I.
Filed Feb. 9, 1970, Ser. No. 9,676
Int. Cl. B65h *17/26*
U.S. Cl. 226—140 **6 Claims**

An adjustable roll feed for stamping presses and the like for imparting intermittent linear feed to strip stock, said feed having first adjustment means for permitting the length of feed per revolution of the rolls to be adjusted between zero

and a maximum length based on the diameter of the rolls and having a second adjustment means permitting a fine adjustment of the length of feed to be effected while the feed is in operation.



3,653,570

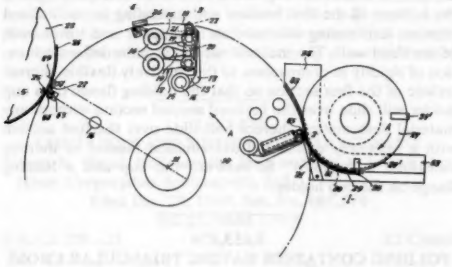
STITCHING MACHINE

Arthur Graham Alsop, Bristol, England, assignor to Strachan and Henshaw Limited, Bristol, England

Continuation-in-part of application Ser. No. 729,588, May 16, 1968. This application May 15, 1970, Ser. No. 37,765

Int. Cl. B27f 7/12

U.S. Cl. 227—81 **7 Claims**



An axial feed rotary staple stitching machine has a rotating stitching cylinder with stitching heads, each of which includes means for shaping and holding a blank from which a staple is formed, and means for applying the staple against a clinching block, all of which means rotate with the stitching cylinder. The blank is fed tangentially to the stitching cylinder but with its axis parallel to that of the stitching cylinder, by pushers on a delivery cylinder. The machine can exercise a collection function if one or more of the pushers are prevented from acting, without change in the number of stapling heads or collecting stations.

3,653,571

FINE WIRE BUTT WELDER

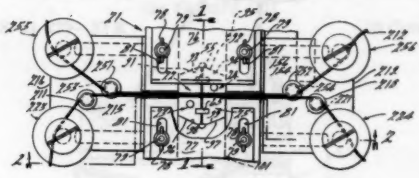
Walter J. Rozmus, Hubbardsville, and Matt T. Rozmus, Barneveld, both of N.Y., assignors to Kelsey-Hayes Company

Continuation-in-part of application Ser. No. 766,813, Oct. 11, 1968. This application June 19, 1969, Ser. No. 834,781

Int. Cl. B23k 21/00

U.S. Cl. 228—3 **10 Claims**

A fine wire welding machine for cold butt welding small diameter wires through a multiple upset technique. The machine includes a loading mechanism for accurately positioning the fine wire strands for subsequent engagement with the welding dies and the welding dies are movable in a plane parallel to their abutting faces for shearing the wires and aligning the end of the wire from one spool with the end of the wire from another spool for the subsequent welding technique. An improved operating mechanism is incorporated for operating the dies for movement in a predetermined sequence whereby the dies first move into gripping relation with the respective wire ends, the dies then move together to upset the wire ends, next the dies release the wire ends while still held in the upset position and finally the dies retract from their upset position for a repeat of the cycle.



3,653,572

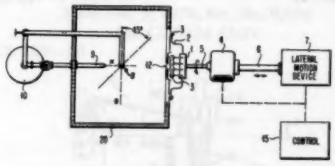
HOT GAS SOLDER REMOVAL

Sherman Z. Dushkes, Redwood City, Calif., and Conrad Trollmann, Sindelfingen, Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 5, 1969, Ser. No. 855,519

Int. Cl. B23k 1/20

U.S. Cl. 228—20 **4 Claims**



Disclosed is a device for preparing solder coated leads for the final soldering operation. Excess solder is stripped from the solder coated leads by immersing these leads into streams of hot, dry gas. This stream of gas melts and flows away excess solder. A thin coating of solder is retained on the leads. The gas is preferably inert and the process takes place in a chamber which is substantially free of oxygen. This retained solder is ultimately used in the final bonding operation of the lead to a circuit board.

3,653,573

CASING CENTRALIZER AND MANDREL FOR USE IN WELDING LARGE DIAMETER CASING

Cicero C. Brown, c/o Brown Oil Tools, Inc. P. O. Box 19236, Houston, Tex.

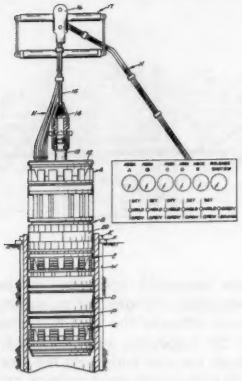
Filed Oct. 3, 1968, Ser. No. 764,787

Int. Cl. B23k 1/20

U.S. Cl. 228—5 **10 Claims**

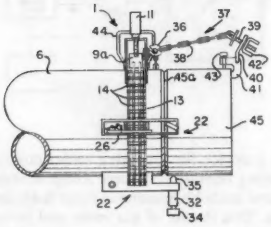
A tool for use in welding together large diameter casing sections, particularly in forming liners for deep earth bores. The tool includes fluid pressure actuated expander assemblies operative to align the casing sections, assure concentricity of the sections at the weld joint, and to position an ex-

pansible chill ring opposite the weld joint. The tool also includes elements enabling pressure testing the welds, and



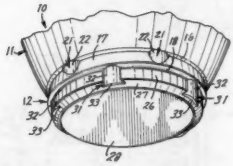
hydraulic jacking means for moving the tool longitudinally of the casing.

3,653,574
PIPE CLAMPING APPARATUS
Timothy C. Dearman, 4191 East Stanley Road, Mt. Morris, Mich.
Filed Dec. 11, 1969, Ser. No. 884,140
Int. Cl. B23k *1/14*
U.S. Cl. 228—49 **15 Claims**



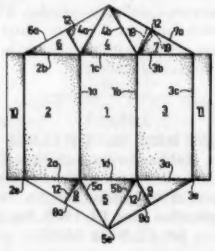
Clamping apparatus for use in joining two lengths of pipe to one another comprises a carrier or body adapted to be seated at one end of one pipe and to which is anchored one end of a flexible, elongate clamping chain which may be secured at any selected position along its length to the body so as to form with the latter a loop encircling the one pipe. Mounted on that portion of the clamping chain between the points of its connection to the body is a plurality of support members each of which is adjustable longitudinally of the chain. Each support member extends laterally of the chain to a position beyond the end of the one pipe section and is provided with adjustable supporting fingers that are adapted to engage and support the end of the pipe to be joined to the one pipe. An auxiliary, adjustable support may be connected to the body for assisting in the aligning and supporting of the two pipe lengths.

3,653,575
HOLDER AND CUP
Gerald A. Schrepper, Kalamazoo, Mich., assignor to Fabri-Kal Corporation, Kalamazoo, Mich.
Filed July 13, 1970, Ser. No. 54,361
Int. Cl. A47b *19/23*; B65d *21/02*
U.S. Cl. 229—1.5 H **10 Claims**



A nestable, thin wall, integral, thermoplastic insert drinking cup for use with a cup holder. The cup has a side wall with a container zone and a spacing and anchoring zone. The side wall of the container zone diverges upwardly and outwardly from the bottom of the upper section to an upper circumferential margin defining an open upper end. The spacing and anchoring zone has a first wall portion connected to the bottom of the upper section, an inwardly extending flange connected at the bottom of the first wall, a second wall portion connected to the inner edge of the inwardly extending flange and a third wall portion connected at the bottom of the second wall and tapering downwardly therefrom convergingly to a bottom wall joined to the bottom of the third wall. A plurality of circumferentially spaced radial holding protuberances are provided on the second wall with each radial holding protuberance have a first section located immediately adjacent the inwardly extending flange and which extends axially downwardly therefrom generally parallel to the central axis of the cup and a second section connected to the bottom of the first section and extending in an inclined relation terminating intermediate the upper and lower ends of the third wall. The inclined second section defines a location of rigidity in comparison to the relatively flexible characteristic of the first section so that the holding flange on a cup holder will slide over the inclined second section without any material deformation thereof and slide over the first section with a relatively substantial deformation thereof to thereby constitute a "snap-in" fit between the cup and a holding flange on the cup holder.

3,653,576
FOLDING CONTAINER HAVING TRIANGULAR CROSS SECTION
Stranicky, Fedor, Solna, Sweden, assignor to AB Svensk Industries Konstruktions-och Beraknings-Kontor SIKOB, Solna, Sweden
Filed Jan. 13, 1970, Ser. No. 2,530
Claims priority, application Sweden, Jan. 13, 1969, 380/69
Int. Cl. B65d *5/00*
U.S. Cl. 229—22 **14 Claims**



A folding container having a base wall, two side walls and two triangular end walls, at least one of which being adapted

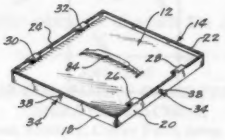
to be opened against the action of resilient means consisting of folded corner portions connecting two edges of said end wall to be opened and adjacent edges of said side walls, each of said corner portions in unfolded position being defined by a substantially straight edge and in folded position being directed into the interior of the container and forming an angle with the end wall.

3,653,577

CAKE COVER

Bernice Irene Wyner, 1624 44th Street, Des Moines, Iowa

Filed June 15, 1970, Ser. No. 46,175
Int. Cl. B65d *13/00*
U.S. Cl. 229—23 R 3 Claims



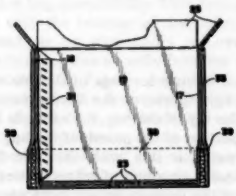
A cake cover comprising a bottom portion and a foldable top portion. The top portion comprises a central quadrilateral portion having first, second, third and fourth flaps extending from the periphery thereof. The flaps are foldable to a flat condition adjacent the underside of the central portion. The top portion may be unfolded from its flat condition to an assembled condition and is maintained in its assembled condition by a plurality of snap-tab fastener elements. The bottom portion comprises a quadrilateral base portion having upstanding wall members at the periphery thereof. The top portion, when in its folded condition, may be received between the wall members adjacent the base portion for storage purposes. The top portion, when in its assembled condition, may be detachable secured to the wall members to provide a cover means for a cake. The assembled cover is provided with a handle to permit carrying of a cake housed therein.

3,653,578

CONTAINER AND METHOD OF MAKING SAME

Robert N. Wood, Indianapolis, Ind., assignor to Inland Container Corporation, Indianapolis, Ind.

Filed Dec. 29, 1969, Ser. No. 888,570
Int. Cl. B65d *13/04*
U.S. Cl. 229—23 22 Claims



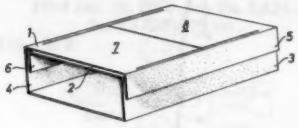
A reinforced fiberboard container having a plurality of reinforcing pads adhesively attached to its vertical sidewalls. Each reinforcing pad has a height substantially less than the height of the attached sidewall, and the method of adhesive attachment is such that sidewalls of the container are bowed inward in a region vertically adjacent the reinforcing pads. When the container is made of outer and inner units, the pads are preferably disposed between the sidewalls of the units but may also be located on the inner surface of the inner unit. When the reinforcing pads are to be located adjacent the upper and/or lower edges of the sidewalls, sidewall extensions may be provided which can be folded upward or downward to create the pads.

3,653,579

FOLDING CARTON CONSISTING OF A STRIP OF SHEET MATERIAL FOLDED TO FORM A TUBE AND PROVIDED WITH END WALLS

Fedor Stranicky, Solna, Sweden, assignor to AB Svensk Industris Konstruktions-och Berakningskontor Sikob, Solna, Sweden

Filed June 12, 1970, Ser. No. 45,776
Claims priority, application Sweden, June 12, 1969, 8396/69
Int. Cl. B65d *5/02*
U.S. Cl. 229—37 R 10 Claims



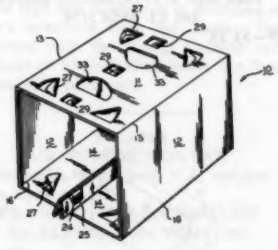
A folding carton comprising a blank of sheet material folded to form a tube having at least one plane side wall and at least at one end of the tube an end wall. The end wall consists of a flap cut out in the plane side wall of the tube and folded an angle of 180° along a first fold line towards and beyond the end of the tube and then is folded along a second fold line to cover the end of the tube.

3,653,580

WRAPAROUND CARRIER WITH CHIME LOCKING STRUCTURE

John V. Mahon, Lansdale, Pa., assignor to Container Corporation, Chicago, Ill.

Filed Feb. 9, 1970, Ser. No. 9,646
Int. Cl. B65d *65/24*
U.S. Cl. 229—40 4 Claims



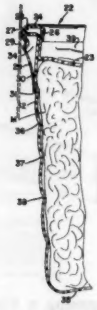
A chime locking structure for a wraparound carrier for chimed containers of the type wherein the chimed ends are adjacent an annular groove formed in the container body. The chime locking structure is formed from confronting tabs having distal free ends folded upon themselves so as to engage the annular groove adjacent the chimed ends, and also to engage the chimed ends of the containers. An opening is provided in the folded distal free ends and spaced therefrom to provide a locking element engageable with the annular groove of the container adjacent the chime.

3,653,581

HERMETIC PACKAGING WITH PLASTIC CONTAINER

Louis R. Ptak, Western Springs, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Apr. 10, 1968, Ser. No. 720,176
Int. Cl. B65d *5/69, 43/10*
U.S. Cl. 229—43 **7 Claims**



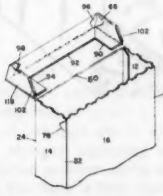
A hermetic package for processed food products. The container and lid are made of plastic materials. The lid snaps on the container lip, or may be heat-sealed thereto. A shrink band embracing the container and the lid rim reinforces the grip and supplements the seal of the lid to the container. For large, elongated packages, the container and lid may be formed with relatively thin, uniform walls, reinforced to afford a homogenous flexural characteristic in the completed package which ensures integrity of the closure, while minimizing failure due to stresses imposed under vacuum or handling loads on the package.

3,653,582

CARTON HAVING A HINGED END CLOSURE

John W. Scully, Raynham, Mass., assignor to Pneumatic Scale Corporation, Quincy, Mass.

Filed Sept. 2, 1970, Ser. No. 68,864
Int. Cl. B65d *5/54*
U.S. Cl. 229—51 TC **5 Claims**



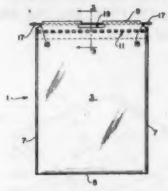
A rectangular carton having a hinged top closure connected to the body portion by weakened lines along the upper edges of the front and end wall panels and adapted to be opened by tearing along the weakened lines, the carton having provision for automatically locking the hinged top closure to the body portion upon reclosing the same whereby to prevent inadvertent opening thereof.

3,653,583

DRAWCORD BAG

Gaylord L. Meyer, Terre Haute, Ind., assignor to Bemis Company, Inc., Minneapolis, Minn.

Filed Sept. 14, 1970, Ser. No. 71,885
Int. Cl. B65d *33/12, 33/28*
U.S. Cl. 229—54 C **5 Claims**



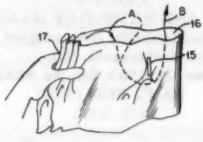
A drawcord bag made of plastic in which drawcords extend through hems at the mouth end of the bag with a special feature for preventing the drawcords from splitting the hems when they are used for carrying the bag.

3,653,584

BAG STRUCTURE WITH INTEGRAL CLOSURE ARRANGEMENT

Connie Lake, Pittsford, N.Y., assignor to Mobil Oil Corporation

Filed Dec. 12, 1969, Ser. No. 884,534
Int. Cl. B65d *33/16*
U.S. Cl. 229—62 **18 Claims**



To provide a closure for bags of flexible material such as polyethylene, light fabric, or the like, a restricted opening is formed near the top of the bag, for example by a seam partitioning off a portion of the mouth of the bag, a pair of seams extending towards a side with the side being slit open between the seams, or a pair of seams between which a slit is cut; the size of the opening is just large enough to enable a user to gather together the remainder of the mouth of the bag and push it through the opening, the released gathered material then flaring out by its own elasticity to provide a closure which will securely hold contents within the bag.

3,653,585

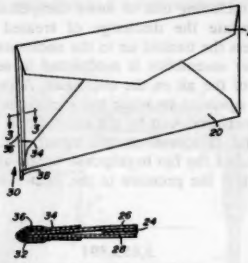
CONTAINER WITH TEAR-TYPE OPENER

Richard H. Kazaros, 5501 West Colonial Drive, Orlando, Fla.

Filed Apr. 15, 1970, Ser. No. 28,824
Int. Cl. B43m *7/00*
U.S. Cl. 229—85 **5 Claims**

An opener for a container such as but not limited to an envelope incorporating a flexible tear strip in the form of a

tape, string or other flexible member incorporated into the envelope so that removal of the tear member will open the



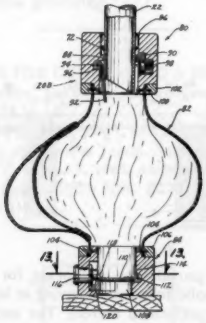
envelope or other container in which the opener is incorporated.

3,653,586

MEANS FOR COLLECTING COINS FROM A COIN OPERATED MACHINE

Gail G. Bonneson, Route 1, Cedar Falls, Iowa

Filed Jan. 20, 1970, Ser. No. 4,433
Int. Cl. A47g *29/00*
U.S. Cl. 232—43.2 **5 Claims**



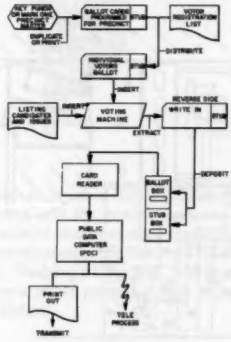
A means for collecting coins from a coin operated machine such as a slot machine or the like comprising, a collector head having a collection bag secured thereto and extending downwardly therefrom. The collector head means includes a first opening extending downwardly therethrough which is in communication with the interior of the collection bag and which is adapted to be detachably secured to a coin discharge tube extending downwardly from the coin operated machine. A pivotal trap door is provided in the support means and is movable from a horizontal position wherein the first opening is closed to a substantially vertical position wherein the first opening is open. A key operated lock means is mounted on the collector head and has a movable bolt extending inwardly into the first opening in the pivotal path of the trap door to selectively prevent the trap door from pivoting to its vertical position. The first opening is also adapted to removably receive an emptying tube which is placed therein to maintain the trap door in its open or vertical position to permit the coins to be emptied from the bag. When the collector head is placed on the discharge tube, the discharge tube pivots the door open. The discharge tube maintains the trap door in its vertical or open position while coins are being deposited in the collection bag from the machine. When the collector head is removed from the discharge tube, the trap door moves to its locked and closed position to prevent the pilfering of the coins in the collection bag. A modification of the device is also disclosed wherein a key operated emptying head assembly is provided on the bottom of the collection bag for dumping the coins therefrom. A further modification is also disclosed and involves the use of a removable retainer bracket which is inserted in the collector head to maintain the trap door in an open position after the collection bag has been emptied. A still further modification is disclosed and involves the use of a pivotal retainer pin in the collector head which maintains the pivotal trap door in an unlocked position after the coins have been emptied from the collection bag.

3,653,587

BALLOTING SYSTEM AND APPARATUS THEREFOR

Seymour B. Hammond, 1381 Wilton Way, Salt Lake City, Utah, and Kenneth M. Larsen, 4473 Abinadi Road, Salt Lake City, Utah

Filed Jan. 26, 1970, Ser. No. 5,634
Int. Cl. G07c *13/00*
U.S. Cl. 235—50 R **9 Claims**



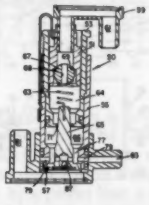
A balloting system, including a special voting machine; ballots, in the form of a data-recording medium for recording data in response to selections of an individual voter and carrying stored program information pertinent to that voter's election district; and data-processing means for tabulating the voting data in accordance with the stored program carried by the ballot. The voting machine is compact; it is adapted to display candidates and issues in conventional, paper ballot format and to receive a ballot of the aforedescribed type and position it in recording relationship with a voter's selections from the display. Data-marking means associated with the voting machine records each voter's selections on his individual ballot in a form susceptible to electronic data processing.

3,653,588

AIR DISTRIBUTION UNIT

Richard C. Dreibelbis, Fair Lawn, N.J., assignor to Carrier Corporation, Syracuse, N.Y.

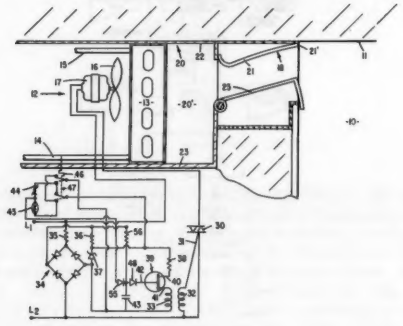
Filed May 1, 1970, Ser. No. 33,573
Int. Cl. G05b *11/44*; F24f *11/04*
U.S. Cl. 236—49 **7 Claims**



An air distribution unit for discharging conditioned air into an area to be treated, including a variable volume control

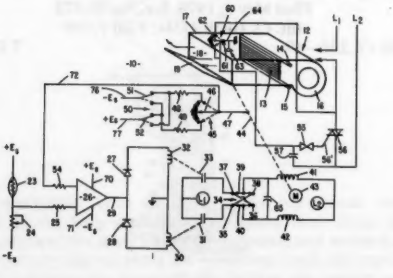
chamber regulating the volume of conditioned air supplied to the area. A control valve is operable to regulate the variable volume control chamber to maintain a substantially constant discharge of conditioned air into the area, irrespective of changes in supply air pressure. The control valve includes a first orifice for passage of a minimum quantity of control air through said valve to the control chamber. A bleed thermostat associated with the control valve regulated the quantity of control air supplied to the variable volume control chamber through the valve in response to area temperature.

3,653,589
AIR CONDITIONING SYSTEM
William L. McGrath, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed July 27, 1970, Ser. No. 58,312
Int. Cl. F24f *7/06*
U.S. Cl. 236—49 **2 Claims**



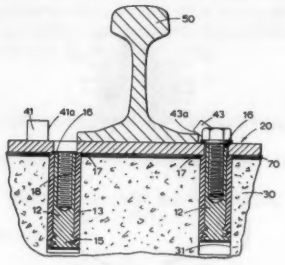
A system for supplying treated air to an enclosure including a heat exchanger through which a heat exchange medium flows and a fan arranged to route air to be treated over the heat exchanger in heat transfer relation with the medium. A control operates to vary the speed of the fan in response to changes in room temperature. At least one outlet is provided for discharging the treated air from the system, the outlet being positioned so that the treated air is discharged with minimal turbulence substantially adjacent and parallel to the ceiling of the enclosure.

3,653,590
AIR CONDITIONING APPARATUS
Ralph Elsea, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed July 27, 1970, Ser. No. 58,313
Int. Cl. F24f *7/00*
U.S. Cl. 236—49 **1 Claim**



Apparatus for supplying treated air to an enclosure including a heat exchanger through which a heat exchange medium flows and a fan arranged to route air to be treated over the heat exchanger in heat transfer relation with the medium. A supply duct, including one or more damper assemblies provided to regulate the discharge of treated air from the system, delivers the treated air to the enclosure. The position of the damper assemblies is modulated in response to the temperature of the air in the enclosure. A pressure responsive element operates to sense the variations in pressure in the supply duct produced by the modulation of the damper assemblies and creates a control signal which operates to vary the speed of the fan in response to the changes in pressure to maintain the pressure in the duct substantially constant.

3,653,591
RAIL ANCHORAGES
Otto Herman Varga, Bradford-on-Avon, and Leonard Taylor, Wells, both of England, assignors to Resilient Grip Limited, Bristol, England
Filed July 23, 1970, Ser. No. 57,703
Claims priority, application Great Britain, July 1, 1969, 38,197/69; Aug. 2, 1969, 38,852/69
Int. Cl. E01b *9/14, 9/00*
U.S. Cl. 238—308 **11 Claims**

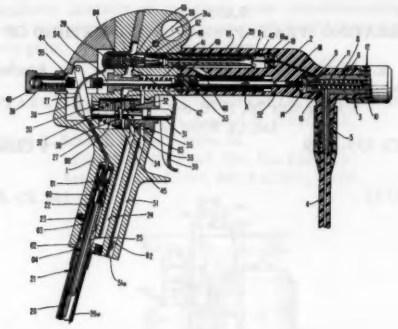


The invention provides an anchorage for securing a flat bottom rail to a solid foundation having at least two circular cylindrical holes preformed therein. The anchorage according to the invention comprises essentially two components, the first component being a metal baseplate having non-circular through holes therein located to register with the preformed holes in the foundation. The second component according to the invention comprises foundation bolt means passing through the holes in the baseplate and in the foundation. The foundation bolt means which comprise a bolt adapted to be passed through the baseplate to engage a nut member located in a hole in the foundation, the nut member being an elongate metal member surrounded at least in part by a sleeve of elastomeric material which can be deformed on axial movement of the nut into engagement with the walls of the foundation hole, said nut member having one end so shaped that it can enter and key with one of the non-circular through holes of the baseplate so that the nut is prevented from rotation relative to the baseplate. The baseplate may be formed with lugs which assist in anchoring the rail and wedge shaped clamping block means may be provided cooperating with the foundation bolt means and the baseplate abutments to secure the rail on the baseplate.

3,653,592
ELECTROSTATIC SPRAY GUN CONSTRUCTION
Philip L. Cowan, Basking Ridge, N.J., assignor to Electrogasdynamics, Inc., Hanover, N.J.
Filed May 7, 1970, Ser. No. 35,428
Int. Cl. B05b *5/02*
U.S. Cl. 239—15 **6 Claims**

An improved construction for a hand operated electrostatic spray coating device of the so-called airless type in

which atomization is effected by the interaction of a high speed fluid stream with air, including a self-contained electrogasdynamic generator as a power source for charging the



spray and maintaining an electrostatic depositing field and a pneumatically assisted fluid valve mechanism operatively responsive to at least a portion of the air flowing through the electrogasdynamic generator.

3,653,593

APPARATUS FOR GENERATING A HIGH VOLTAGE

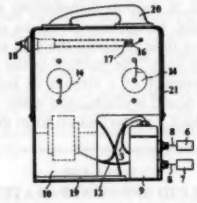
Tamotsu Watanabe, Tokyo, Japan, assignor to Nippon Kogei Kogyo Co., Ltd.

Filed Nov. 10, 1969, Ser. No. 875,114

Claims priority, application Japan, Apr. 16, 1969, 44/28979; Apr. 15, 1969, 44/28764

Int. Cl. B05b *5/00*; **F23d** *11/28*

U.S. Cl. 239—15 **6 Claims**



An apparatus for generating a high voltage which includes a transformer, a rectifying circuit connected to the transformer, a high voltage output terminal connected to the rectifying circuit, a foamed insulator molded into the space between the transformer and the components of the rectifying circuit with the exception of the high voltage output terminal, and a container insulated by the foamed insulator from the high voltage components and electrically grounded.

3,653,594

PRECISION COATINGS SPRAY GUN

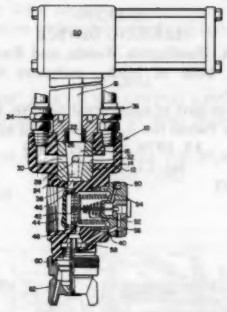
Hendrik F. Bok, Fairhaven, and David A. Garcia, New Bedford, both of Mass., assignors to Epec Industries, Inc., New Bedford, Mass.

Filed Nov. 17, 1970, Ser. No. 90,292

Int. Cl. B05b *7/12*

U.S. Cl. 239—70 **10 Claims**

An automatic spray gun used for precision spray applications where coating thicknesses are required with extremely close tolerances and with a very high degree of repeatability. A valve rotor is placed in the upper portion of the spray gun construction and selectively controls the flow of solvent or coating materials through the spray gun. The valve rotates to selected positions to connect either cleaning solvent or coating material to a filter and nozzle. Provision is made for repeated coatings by selective valve rotation. Control means are included for activating the spray gun for a burst of solvent to allow pre-wetting of a filter area and other internal walls of the spray gun. The control means subsequently



rotates the valve rotor to a coating material position to replace the solvent and the coating spraying operation ensues. Selective solvent and/or coating material cycles flushes the spray gun and eliminates the filter and nozzle orifice from being restricted. Flushing of the gun subsequent to a spray coating operational phase permits a high degree of repeatability in coating output.

3,653,595

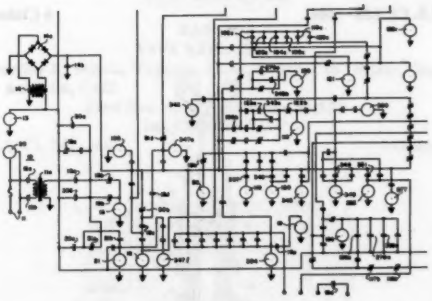
AUTOMATIC TURF WATERING SYSTEMS

Julius Edward Greengard, Jr., and Thomas J. Scannell, both of c/o Cyclomation Systems, Inc. 235 Bay Road, Voorheesville, N.Y.

Filed Dec. 7, 1970, Ser. No. 95,738

Int. Cl. A01g *27/00*

U.S. Cl. 239—70 **10 Claims**



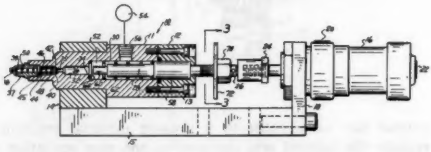
A turf watering control system is provided for automatically watering selected areas of turf according to a preselected plan, which system includes a master control station and a plurality of spaced slave stations each connected to the master station by a power line, a source of operating electric power applied to said master control station, a plurality of sprinkler valves spaced from each slave station, connections between said valves and each said slave station

whereby said valves are selectively opened and closed, an encoder source of radio frequency in said master control station applied to said power lines, decoder means at each of said slave stations, means at said slave stations actuated by said decoder means to energize the connections to said sprinkler valves and means at the master station selectively energizing the encoder means whereby a selected signal is transmitted to selected decoder means through said power lines.

3,653,596
MARKING DEVICE

Paul S. Abrams, Huntington Woods, and Rudolph G. Peterson, Detroit, both of Mich., assignors to Carco, Inc., Detroit, Mich.

Continuation-in-part of application Ser. No. 817,371, Apr. 18, 1969, now Patent No. 3,614,940. This application Jan. 13, 1970, Ser. No. 2,469
Int. Cl. G01d *15/18*
U.S. Cl. 239—93 **8 Claims**

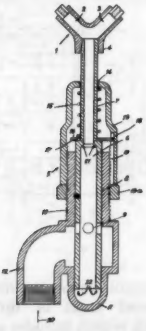


A marking device having a nozzle orifice through which a fluid marking agent is forcibly ejected under pressure for marking an article spaced a distance therefrom. The orifice nozzle is carried on a housing and connected to a reservoir of the fluid marking agent contained therein. The housing includes a pumping element shiftably mounted within the reservoir for separating a portion of the fluid marking agent from the reservoir and pressurizing the separated fluid to forcibly eject a selected amount thereof through the orifice nozzle to mark the article.

3,653,597
ROTARY WATER SPRINKLERS

Ischajahu Blass, 26 Rehov Manneh, Tel Aviv, Israel

Filed Mar. 9, 1970, Ser. No. 17,823
Int. Cl. B05b *15/10*
U.S. Cl. 239—204 **4 Claims**

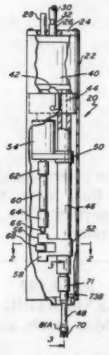


A rotary water sprinkler having a plurality of spray nozzles disposed at the ends of a plurality of conduit arms radiating from a common feed duct and being adapted to rotate about an axis passing through the feed duct under the influence of feed water flowing through the feed duct into the arms, the water sprinkler being provided with a pressure stabilizing device.

3,653,598
VIBRATING SPRAY APPARATUS AND METHOD OF SPRAYING

John E. Waldrum, Ambler, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

Filed May 28, 1970, Ser. No. 41,484
Int. Cl. B05b *3/00*
U.S. Cl. 239—229 **9 Claims**

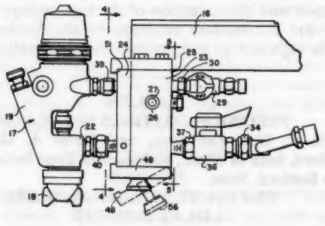


A vibrating spray apparatus and method of spraying which produces a spray pattern of substantial uniform density, the spray apparatus including a spray tube that is free at one of its ends, means to supply liquid to the spray tube from the other end thereof, a motion transmitting device associated with the spray tube to impart vibrations of sufficient magnitude to the spray tube to cause the free end of the tube to move in an orbital path. The method of the present invention involves the movement of a stream of liquid in an orbital path wherein the liquid is discharged while moving in the orbital path to produce a pattern of uniform density.

3,653,599
FLUID SPRAY APPARATUS

Clifford L. Mussehl, Wildwood, Ill., assignor to SPECO, Inc., Beverly, Mass.

Filed May 19, 1970, Ser. No. 38,714
Int. Cl. B05b *15/06*
U.S. Cl. 239—273 **19 Claims**



A fluid spray apparatus having means for releasably mounting a spray gun on a support. The mounting means includes means for carrying shutoff valve means for shutting off the fluid supply at the mounting means. A rubber seal is provided for sealing the connection between the spray gun

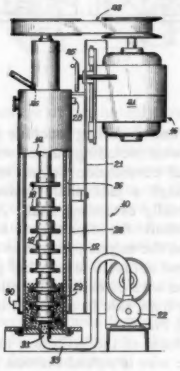
and the mounting means fluid supply passage. Mounting plates for the different types of spray guns, such as air-type spray guns and airless-type spray guns, are provided with different arrangements of the air passages for permitting use of a single fixed means on the support for delivering air to the pneumatic controls of the spray guns notwithstanding different locations of the pneumatic control inlet means on the spray guns.

3,653,600

APPARATUS FOR DISPERSING FINELY DIVIDED SOLID PARTICLES IN A LIQUID VEHICLE

George R. Schold, Hickory Hills, Ill.

Filed July 28, 1969, Ser. No. 845,223
Int. Cl. B02c *17/04*; **B01d** *33/06, 35/06*
U.S. Cl. 241—74 **24 Claims**



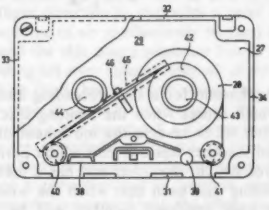
A continuous duty, fully enclosed apparatus for deagglomerating solid, insoluble particles such as pigments and for uniformly distributing and dispersing the particles in a liquid vehicle which involves the utilization of a dispersing media such as steel shot which is retained in a vertically disposed generally cylindrical mixing vessel and agitated by rotating impellers or agitator discs connected to a drive shaft. The apparatus utilizes a rotor separator device connected to and driven by the drive shaft near the vessel outlet to separate media from the finished product just prior to discharging the latter from the mill apparatus.

3,653,601

ENDLESS TAPE MAGAZINE

Carl Wrona, deceased, late of Waiddorf/Nagold, Germany (by Casper Antonius Henricus Mulkens, executor), and Wilhelmus Franciscus Aloysius Heylands, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, N.Y., N.Y.

Original application June 23, 1967, Ser. No. 648,505. Divided and this application Aug. 15, 1969, Ser. No. 871,100
Claims priority, application Germany, June 25, 1966, W 41869; Nov. 9, 1966, N 29467
Int. Cl. B65h *17/48*
U.S. Cl. 242—55.19 A **4 Claims**



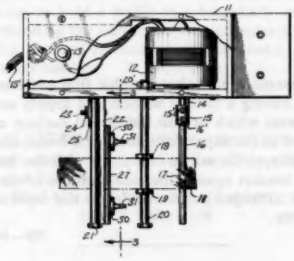
An endless magnetic tape magazine constructed as an oblong box for use on a conventional recording/playback apparatus having a pair of winding spindles. Two pair of aligned apertures are provided through the bottom and top cover of the box. The apertures are spaced apart so as to accommodate the winding spindles of the apparatus. The magazine is provided with a rotatably mounted core about one of the apertures for accommodating a roll of endless tape, and arranged so as to rotate about the spindle passing through the aperture. Guide rollers are provided for guiding the tape along the inside of the magazine and back onto the roll and an additional pair of aligned apertures is also provided for accommodating a drive capstan and insuring correct positioning of the magazine within the recording/playback apparatus.

3,653,602

ELECTRIC ANKLE WRAPPING APPARATUS

Charles M. Harrington, 1107 W. Rine Street, Hattiesburg, Miss.

Filed Apr. 21, 1970, Ser. No. 30,475
Int. Cl. B65h *75/02*
U.S. Cl. 242—60 **2 Claims**



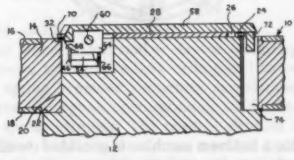
An electric ankle wrapping device including an electric motor secured within a housing that is pushbutton operated. When the pushbutton is pushed it starts the motor to rotate which will cause a notched and removable shaft to roll up the wrap. The device also includes a rod which is fixed and parallel with the rotatable shaft members, the rod having spaced apart guides which will cause the ankle wrap to roll evenly at the edges. The device has a fixed and slotted plate member to which is attached a slideable and adjustable second plate in order to prevent twisting of the wrap.

3,653,603

TAPE REEL CLAMP

Gordon R. Schulz, Tujunga, Calif., assignor to Odetics, Inc., Anaheim, Calif.

Filed Nov. 3, 1970, Ser. No. 86,534
Int. Cl. B65h *17/02*
U.S. Cl. 242—68.3 **9 Claims**



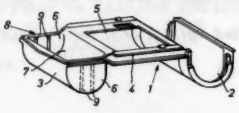
The tape reel clamp provides rotative, radial and axial mounting security. The hub of the tape reel mounts on a rotatable spindle for radial security. A radially expandable ring extends outward from the spindle and engages over the top of the reel hub for axial security. A raisable handle cams the ring into its retracted, non-engagement position wherein the hub can be removed from the post. A pin on the handle

engages a slot in the hub to provide rotative locking of the hub.

3,653,604
PHOTOGRAPHIC FILM CASSETTE

Max Wiesner, Leverkusen; Herbert Sonne, Leichlingen, and Hans-Robert Schmidt, Cologne, all of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 2, 1969, Ser. No. 881,540
Claims priority, application Germany, Jan. 8, 1969, G 69 00 514
Int. Cl. G03b *17/26*
U.S. Cl. 242—71.2 **4 Claims**

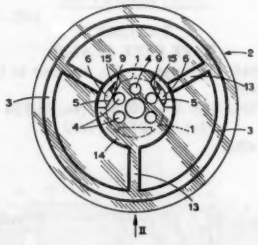


An improvement of a photographic film cassette, which is of the type having a takeup section and supply section, and brake elements which act on the lateral surface of the film coil arranged at the supply chamber. The brake elements are formed of ribs which are in one piece with the housing and bear under tension against the side surfaces of the film roll. The ribs are arranged perpendicular to the separation plane of the cassette.

3,653,605
SPOOLS FOR BUSINESS MACHINES

Derek G. Payne, Sevenoaks, England, assignor to Walter Grafton & Son Limited, London, England

Filed June 1, 1970, Ser. No. 42,046
Claims priority, application Great Britain, June 13, 1969, 30,042/69
Int. Cl. B65h *75/28*
U.S. Cl. 242—74 **6 Claims**

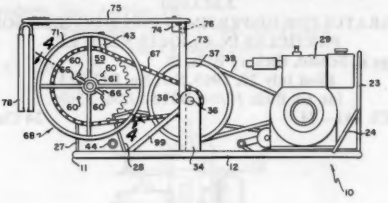


A spool for a business machine is provided on the hub with a prong for the attachment of a ribbon, such as an inked ribbon, to be wound on the spool, and with a projection, preferably on the hub itself, which prevents the prong from cracking, breaking or becoming permanently deformed under the hoop stress due to the wound ribbon. The prong also serves to reduce the risk of the prong being broken by the use, as is the habit of some operators, of a nail file or penknife or the like to facilitate the attachment of the ribbon to the prong.

3,653,606
WIRE REELING MACHINE

Claude Sheets, Jr., 610 E. Kenneth Ave., Spearman, Tex.

Filed Nov. 19, 1970, Ser. No. 90,983
Int. Cl. B65h *75/40*
U.S. Cl. 242—86.8 **7 Claims**



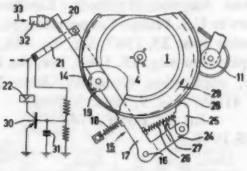
A wire reeling and unreeling machine particularly adapted for reeling fence wire including barbed wire. The machine includes an internal combustion engine mounted on a frame and driving through a jack shaft system including a belt clutch, a horizontally extending shaft. A reel is detachably mounted on the shaft. An idler sheave is hand controlled to tighten the belt on the engine to serve as a clutch. A horizontally swinging hand actuated level wind guide is mounted on the frame with the wire extending therethrough to permit the wire to be swung from side to side as it is being wound so as to wind levelly on the reel.

In a modified form of the invention the reel can be disassembled after the wire is wound thereon to permit the coil of wire to be removed therefrom so that the reel can be reused to form additional coils of wire.

3,653,607
MEANS FOR CAUSING REVERSAL OR SWITCHING-OFF MOVEMENT OF A RECORD CARRIER IN A RECORDING AND/OR PLAYBACK APPARATUS

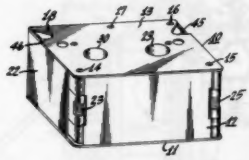
Adriaan Jan Jurriaan Lambeek; Friedrich Laa, and Karl Rupp, all of Vienna, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 10, 1969, Ser. No. 805,515
Claims priority, application Austria, Mar. 11, 1968, A 2369/68; June 18, 1968, A 5834/68
Int. Cl. G11b *15/46;* **B65h** *25/32*
U.S. Cl. 242—191 **13 Claims**



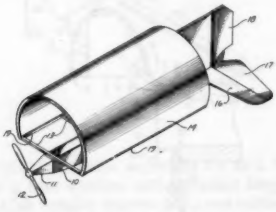
Control mechanism for a tape recording and/or playback apparatus which senses when the winding disc has stopped and will switch off or reverse the movement of the tape. A cam operated member has one end which periodically contacts a control switch, the other end has a feeler in contact with the winding disc such that when the winding disc has stopped the cam operated member will be held in one switching position and will thereby initiate the switching off or reversing operation.

3,653,608
WEB CARTRIDGE
Bernard L. Dickens; Bruno F. Melchionni, both of Cherry Hill, N.J., and Raymond R. Werner, Northboro, Mass., assignors to RCA Corporation
Filed Dec. 23, 1969, Ser. No. 887,616
Claims priority, application Great Britain, Mar. 14, 1969, 13,443/69
Int. Cl. G03b *1/04*; G11b *15/32*, *23/04*
U.S. Cl. 242—199 10 Claims



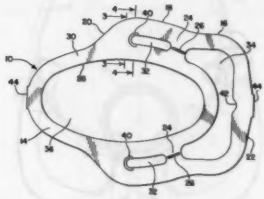
A six-sided web storage device having three fixed sides and three movable sides. The movable sides are mounted to the fixed sides of the device by spring biased hinges. The movable sides are releasably held in enclosing relation by the cooperative action of latching means on the fixed sides. A pair of web reels are captively mounted for rotation between fixed sides of the device. Resilient means are included in the mounting of the reels to provide rotational drag when the reels are disengaged from a driving means, the device being properly apertured to permit operation of the reels by the driving means. Release of the enclosing movable sides exposes a web which may be wound between the reels and provides access through apertures in the fixed sides for withdrawing the web from the device.

3,653,609
LIFT STRUCTURE
Paul F. Bruning, Altadena, Calif., assignor to Electronic Machining Company, Pasadena, Calif.
Filed Jan. 22, 1970, Ser. No. 4,796
Int. Cl. B64c *3/10*
U.S. Cl. 244—13 11 Claims



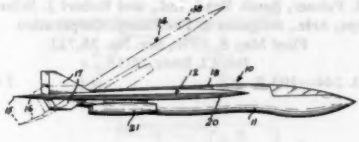
A lifting body in the general form of approximately a semicylinder is connected to the fuselage of an aircraft for providing lift during flight. The lifting surface is substantially free of camber and is concave on its lower face in a direction transverse to the flight direction so that with a small angle of attack a large volume of air is effectively trapped beneath the lifting body, and the side edges minimize loss of air laterally thereby providing lift over substantially all of the lifting surface. The lifting body has a length along the direction of flight greater than the width transverse to the direction of flight for providing a low aspect ratio. Conventional elevators and a rudder are provided for control. In another embodiment the lifting body is formed in a helical shape for acting in the manner of a propeller and in another embodiment a fuselage is integrally connected with the lifting body in an arrangement where the lifting body also has capacity for helium for lighter than air flight.

3,653,610
CONTAINER CARRIER
Ronald Charles Owen, Harwood Heights, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed Dec. 17, 1969, Ser. No. 885,792
Int. Cl. A47j *45/00*
U.S. Cl. 294—31.2 5 Claims



A plastic carrier of a unitary structure for holding bottles in which the carrier includes an integral endless band and bail operating to hold a bottle in substantially vertical position by positioning the carrier about a complementary bottle and pivoting the bail portion about the center line of the complementary bottle.

3,653,611
SLOTTED DELTA WING AIRCRAFT
Mason Trupp, and Granbyrne Garrison Trupp, both of 310 Blanca Lane, Tampa, Fla.
Filed Mar. 24, 1970, Ser. No. 22,214
Int. Cl. B64c *3/38*
U.S. Cl. 244—48 3 Claims

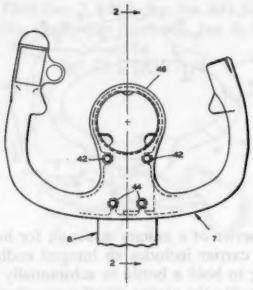


A slotted delta wing aircraft wherein there is provided a delta wing air frame member that is attached axially by its trailing edge to the rear of the fuselage of the aircraft, and wherein this construction permits vertical and short take-offs as well as increased acrobatic maneuverability, and wherein ingestion of hot gases by propulsion units is prevented.

3,653,612
CONTROL WHEEL FORCE SENSOR DEVICE
Raymond D. Palfreyman, Clifton, N.J., assignor to The Bendix Corporation
Filed Sept. 21, 1970, Ser. No. 73,940
Int. Cl. B64c *13/04*
U.S. Cl. 244—83 E 16 Claims

A control wheel force sensor device including a control element having spring members orthogonal to one another and each spring member mounting semiconductor strain gauges to provide signals corresponding to the flexure of the associated spring member. The control element has an end portion affixed interiorly to a base member carried by the control wheel, while an opposite free end portion of the control element provides an inner bearing surface operably positioned in a nutational bearing mounted in an inner hub portion on which the control wheel may be angularly and linearly positioned. In the nutational bearing, supporting means carrying a single ball or row of bearing balls is so arranged as to permit linear motion of the free end inner bearing surface portion of the control element in relation to the single ball or the bearing balls and a nutating motion of such

free end inner bearing portion of the control element in relation to the ball or balls carried by the supporting means. Such linear and nutating motion of the free end inner bearing portion of the control element upon operation of the control wheel permits a corresponding flexure of the associated spring member of the control element by the control wheel in



effecting control of an aircraft in pitch and roll sense. The strain gages on such orthogonal spring member may be connected in an electrical bridge circuit so as to differentially unbalance the bridge and provide an electrical output corresponding to the forces applied to the spring member in said pitch and roll senses to modify an automatic pilot control system.

3,653,613

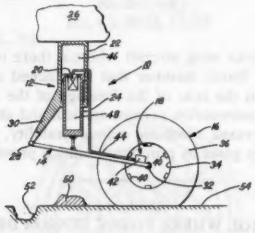
ENERGY ABSORBING DEVICE

Roy M. Palmer, South Bend, Ind., and Robert J. Schoenhals, Tempe, Ariz., assignors to The Bendix Corporation

Filed May 8, 1970, Ser. No. 35,721

Int. Cl. B64c *25/58*

U.S. Cl. 244—103 R **7 Claims**



An energy absorbing device comprising: an energy absorber, including relatively fixed and telescoping portions; a lever operatively connected to said energy absorber; a wheel, including a pressurized tire rotatably carried on said lever; pressure sensors carried on said wheel for monitoring the pressure in said tire; and means for modifying the energy absorbing characteristics of said energy absorber means in response to signals transmitted from said pressure sensors to minimize the effect of vertical deflections on said energy absorber.

3,653,614

BOMBLOAD HANDLING APPARATUS

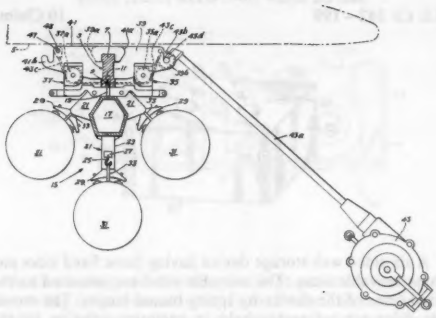
Joseph P. Ruggeri, 214 Third Ave., Cherry Hill, N.J.

Filed Jan. 14, 1971, Ser. No. 106,520

Int. Cl. B64c *1/22*

U.S. Cl. 244—137 R **7 Claims**

Subject disclosure relates to novel and improved apparatus for loading and unloading a bombload ejection subassembly on an aircraft bombrack. When an asymmetric bombload is to be handled, the apparatus includes a sheave assembly which is secured to the bombload assembly such that its axis of rotation is positioned vertically above the center of gravity of the bombload assembly, a single cantilever element which hooks or locks on the aircraft bombrack frame and extends outwardly over the sheave assembly and a hoist mechanism



which is cradled on the end of the cantilever element and controls a lifting cable which is reeved about the sheave assembly. When a symmetric bombload is to be handled, the apparatus includes a pair of sheave assemblies which extend outwardly from opposite sides of the bombload assembly, a pair of cantilever elements which are secured to the bombrack frame above the sheave assemblies, and a hoist mechanism.

3,653,615

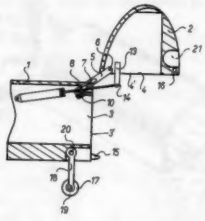
AIRCRAFT NOSE OPENING MECHANISM

William G. Spence, 2372 Wilson Ave., Montreal, Quebec, Canada

Filed June 3, 1969, Ser. No. 829,908

Int. Cl. B64d *9/00*

U.S. Cl. 244—137 **3 Claims**



An airplane preferably for carrying cargo, having a nose portion openable by a simple mechanism to fully uncover a front loading and unloading opening. The landing gear serves also to lock the nose portion in closed position.

3,653,616

CUTTING MECHANISM

Manuel Weinstock; Osyp Nimylowycz, both of Philadelphia, Pa.; Edward J. Wiggett, Cinnaminson, N.J., and Obie Palmer, Philadelphia, Pa., assignors to The United States of America as represented by the Secretary of the Army

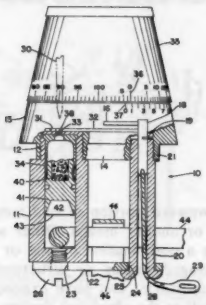
Filed June 24, 1970, Ser. No. 49,357

Int. Cl. B64d *17/58*

U.S. Cl. 244—150 **7 Claims**

A parachute arrangement for pin point soft landing air cargo that includes a hand settable time delay cutting

mechanism for cutting the reefing line of a cargo attached parachute after a predetermined drag force has been exerted upon a release pin cable. The mechanism includes a ballistic cutting blade carrying a powder charge in alignment with a

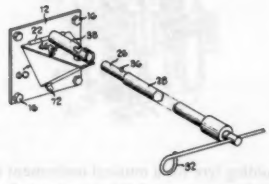


timer controlled firing pin. A release pin actuates the timer when the cable drag force removes the release pin from its normal position extending in the path of a timer lock member.

3,653,617
MULTI-POSITION, MULTI-MOUNT I. V. ROD AND HOLDER

Joseph P. Saternus, Midlothian, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Mar. 24, 1970, Ser. No. 22,285
Int. Cl. A47f 7/28
U.S. Cl. 248—42 **1 Claim**



A multi-position holder, especially for an I. V. rod is constructed of a base member and a bracket hinged and angularly adjustable relative thereto and a rod holder member angularly adjustable relative to the bracket.

3,653,618
INSULATION PROTECTOR FOR PIPE HANGERS

Robert D. Kindorf, 448 Scenic Ave., Piedmont, and David O. Kindorf, 6257 Girvin Drive, Oakland, both of Calif.

Filed Jan. 12, 1970, Ser. No. 2,128
Int. Cl. F16l 3/02
U.S. Cl. 248—58 **2 Claims**

A member of sheet material curved to conform to the external surface of pipe insulating material to protect the insulating material by distributing the weight of the pipe over a large area as compared to the relatively small area of narrow pipe hanger. The protector is designed to fit within a pipe hanger and to have means of very simple and inexpensive construction to secure it to the pipe hanger during the time between its installation in the hanger and the installation of the insulation material.

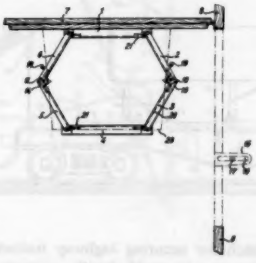
Various means have been devised for protecting pipe insulation at the areas where it is engaged by hangers which support the pipe and the insulation. The insulation is generally of relatively soft, light material designed to insulate against the

flow of heat either to or from the pipe and its contents. It has very little strength particularly in compression to which it is subjected when it is disposed between a hanger and the pipe supported by a hanger.

3,653,619
GARBAGE BAG HOLDER WITH APPURTENANT GARBAGE BAG

Paul Ejler Plum, Klampenborgvej 8 A, 2800 Klampenborg, Denmark

Filed Apr. 23, 1970, Ser. No. 31,224
Claims priority, application Japan, May 2, 1969, 44/34263
Int. Cl. B65b 67/12; A47f 7/00
U.S. Cl. 248—99 **6 Claims**



A garbage bag holder comprising a polygonal rod system consisting of mutually articulated rods, one element of the rod system being connected to one part of a cupboard, e.g. a cupboard door, and another element being connected to another cupboard part, e.g. a frame to which the door is hinged, so that the rod system is transferred from an open position to a closed position and vice versa when the two cupboard parts are moved in relation to one another.

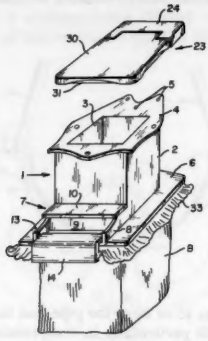
3,653,620
BAG HOLDER

Hubert J. O. H. Benoit, 8530 25th Ave. Apt. #6, Montreal, Quebec, Canada

Filed Dec. 22, 1970, Ser. No. 100,657
Int. Cl. B65b 67/12
U.S. Cl. 248—101 **7 Claims**

A bag holder for use in a kitchen counter includes a cover for mounting over an opening in the counter, a frame with a vertical garbage receiving passage for mounting beneath the counter, and a bag-supporting plate, which can be secured beneath the frame to fix the upper open end of a plastic garbage bag between the frame and the plate. The frame and

plate have complementary cowl-shaped flanges on one side. The connection between the frame and plate is completed by



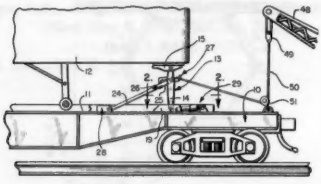
a pivotable latch on a side of the frame remote from the cowl-shaped flanges for engaging the plate.

3,653,621

SNUBBING ARRANGEMENT FOR COLLAPSIBLE TRAILER HITCH

Ray L. Ferris, Thornton, Ill., and Walter J. Marulic, Gary, Ind., assignors to Pullman Incorporated, Chicago, Ill.

Filed Oct. 6, 1969, Ser. No. 864,059
Int. Cl. B60p 7/00
U.S. Cl. 248—119 S 3 Claims



A trailer hitch for securing highway trailers on the flat deck of a railway car is provided with an improved snubbing device for cushioning the hitch when it collapses from an operative to an inoperative position. The snubbing device comprises a hydraulic unit which is connected to the upright strut and which is operative only during the collapse of the strut to a horizontal position on the deck. The hydraulic snubbing device and connection to the strut is so arranged as to provide an initial free fall of the strut to a certain point after which the snubbing device acts to retard the speed of falling movement of the strut, up to a point prior to full collapse whereupon the snubbing device again becomes inoperative and permits the free fall of the strut to its collapsed position.

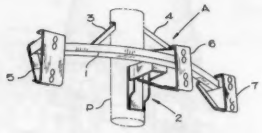
3,653,622

NONLINEAL CROSSARM FOR BRACKETING ELECTRICAL DEVICES

Marion R. Farmer, Memphis, Tenn., assignor to Aluma-Form, Inc.

Filed Apr. 20, 1970, Ser. No. 29,852
Int. Cl. H02g 7/20
U.S. Cl. 248—221 32 Claims

A nonlineal or arcuate crossarm, preferably formed from extruded material such as an aluminum alloy, is anchored to a utility pole, and a series of brackets connecting proximate each end and at the midpoint of said crossarm support electrical devices such as arresters, switches, potheads, or the like; the spatially disposed brackets undertake various forms and modifications, but in general each bracket is constructed having a mounting surface which is held by support means comprising an angle or a plate to the crossarm, with a brace



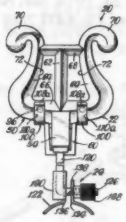
securing the downward portion of said mounting surface to said supporting or anchor means. Other spatially arranged brackets include a combination of one or more angles, including multi-flanged angles or structural tees, that are secured to the crossarm, and have exposed mounting surfaces to which either the electrical devices, or various pads and hangers for holding such devices may be connected.

3,653,623

MUSIC HOLDING LYRE FOR A MUSICAL INSTRUMENT

Herbert L. Johnston, Columbia City, Ind., assignor to Plasti-Music Company, Inc., Evansville, Ind.

Original application Feb. 2, 1968, Ser. No. 702,633, now Patent No. 3,539,143. Divided and this application Jan. 19, 1970, Ser. No. 8,154
Int. Cl. G10g 5/00
U.S. Cl. 248—231 3 Claims



A music holding lyre for a musical instrument comprising a clamping mechanism especially constructed for holding either one or more paper sheets of music or a music holder of the type including a generally flat rigid supporting member for hingedly supporting sheets of music and having projecting means projecting from opposite surfaces thereof, and novel mounting means for mounting the lyre to a musical instrument.

3,653,624

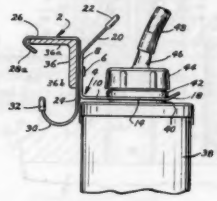
SUPPORT DEVICE FOR FLUID RECEPTACLES

Allen J. Abel, 3110 Ridgewood Road, St. Paul, Minn.

Continuation-in-part of application Ser. No. 741,673, July 1, 1968, now Patent No. 3,548,827. This application Aug. 7, 1970, Ser. No. 62,025
Int. Cl. A61m 27/00
U.S. Cl. 248—312 5 Claims

A support device for fluid receptacles, particularly for holding body fluid collecting receptacles at the edge of a hospital bed, comprised of a right angle bracket including means for engaging and holding a liquid receptacle in an upright position, and a mounting plate to which the receptacle holding bracket is pivotally connected. The mounting plate includes flange means at one end thereof for removably

attaching the support device to a bed frame member having flat or planar wall elements, and an arcuate hanger at the opposite end thereof for suspending said support device on a round frame member of a wheeled stretcher or wheel chair. The mounting plate may be rotatably adjusted with respect to the receptacle holding bracket to bring either the flange attachment means or the arcuate hanger into position to engage a frame member, the pivotal connection between the receptacle holder bracket and the mounting plate further permitting the mounting plate to pivot to various angular positions with the frame member to which it is attached while the receptacle holding bracket remains in its normal position of use to thereby continuously support a liquid receptacle in an upright position so that its contents will not be spilled.

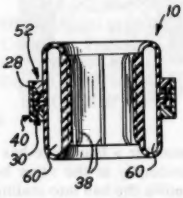


3,653,625

MICROPHONE SHOCK-MOUNTING APPARATUS

Gerald W. Plice, Morton Grove, Ill., assignor to Shure Brothers, Inc.

Filed Nov. 3, 1969, Ser. No. 873,530
Int. Cl. F16f 15/04
U.S. Cl. 248—358 R 2 Claims



Apparatus for shock-mounting a microphone comprising a compact, resilient mounting member defining a socket adapted to receive a microphone body and means for supporting the mounting member in a desired position. The mounting member defines an enclosed space encircling the socket that is preferably filled with a fluid, such as a liquid or pressurized gas. The action of the shock mount can be modified by the selection of different viscosity gases or liquids, or by the addition of foam to affect viscous damping and thereby permit tuning of the apparatus for a particular application.

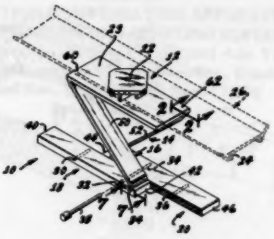
3,653,626

ADJUSTABLE TRESTLE

James I. Tucker, Manhattan Beach, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Nov. 2, 1970, Ser. No. 86,210
Int. Cl. F16m 11/06
U.S. Cl. 248—371 10 Claims

An adjustable trestle for a toy track system having movable crossed arms and slideable base elements for varying the vertical height of the trestle and the degree of slope of a connected track section. The trestle comprises an upper support element which is connectable to a track section, two slideable base elements and the two arms each of which pivotally connect at one end to the upper support element and at the opposite end to one of the base elements. Each pivotal connection is achieved with a thin gauge readily flexible region which is inexpensively formed but highly reliable in operation.

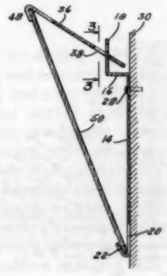


3,653,627

MIRROR MOUNTING MEANS

Homer C. Holloway, 16332 E. Candlelight Drive, Whittier, Calif.

Filed Jan. 29, 1970, Ser. No. 6,721
Int. Cl. A47g 1/16
U.S. Cl. 248—488 4 Claims



A mirror mounting device having a support member attachable to a wall and a second member removably attached to an upper end part of the part attachable to a wall, the free ends of said members having transverse flanges turned toward each other for engagement with upper and lower edge portions of a mirror, thereby retaining the mirror in an angular position.

3,653,628

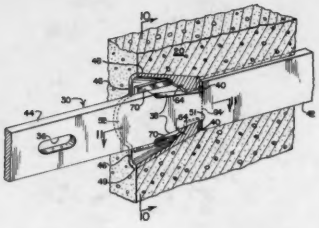
TIE ROD AND CONE ASSEMBLY FOR A CONCRETE WALL FORM

James C. Shoemaker, Hampshire, Ill., assignor to Symons Corporation, Des Plaines, Ill.

Filed Sept. 22, 1970, Ser. No. 74,397
Int. Cl. E04g 17/10
U.S. Cl. 249—214 10 Claims

Two unitary one-piece plastic concrete-sealing cones for telescopic reception over the end regions of a flat tie rod which extends across the opposed spaced apart sides of a concrete wall form. The cones serve as washers to prevent concrete from passing through the tie rod openings in the form sides, and they also serve as spreader members, in which case they become interlocked with the tie rod against longitudinal shifting therealong. The cones establish voids in

the side surfaces of the hardened concrete wall in the vicinities of breakbacks in the tie rod and a hammer blow on each projecting end of the tie rod releases such end from the concrete wall and effects removal of at least a portion of the adjacent cone from the adjacent void.

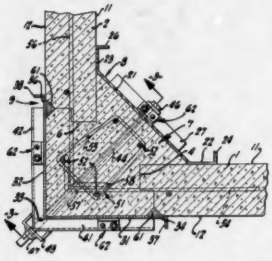


3,653,629

BUILDING CORNER FORM STRUCTURE

David H. Keyston, Burlingame, Calif., assignor to Anza Pacific Corporation, Burlingame, Calif.

Filed Mar. 14, 1969, Ser. No. 807,337
Int. Cl. E04g *11/00*
U.S. Cl. 249—19 13 Claims



A reusable building form structure defined by opposed, rigid, preformed, self-supporting form members, and a method of utilizing the same with previously erected building wall panels, to produce a corner column defined by settable construction material introduced into the space delimited by the wall panels and the corner form structure. Improved alignment means are provided on adjacent form members to insure proper interengagement of abutting form members vertically arranged end-to-end to permit formation of corner columns of varying heights.

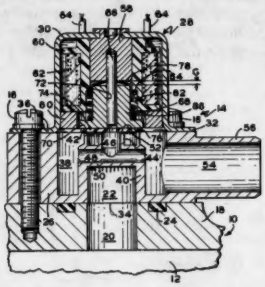
3,653,630

SOLENOID VALVE WITH PLURAL SPRINGS

Irving R. Ritsema, South Bend, Ind., assignor to The Bendix Corporation

Filed July 15, 1970, Ser. No. 54,965
Int. Cl. F16k *31/06*
U.S. Cl. 251—129 2 Claims

A solenoid valve having particular utility in adaptive braking systems on automotive vehicles, in which the armature is provided with a conventional coil spring urging it toward its released position. A supplementary spring in the form of a bowed or wave washer whose free height is less than the total air gap of the valve also acts as an anti-residual magnetism shim. The supplementary spring makes it possible to minimize closing and opening times of the valve.

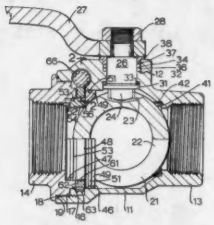


3,653,631

BALL VALVE CONSTRUCTION

Gordon F. Hurst, 540 Callan Ave., San Leandro, Calif.

Filed Oct. 23, 1969, Ser. No. 868,754
Int. Cl. F16k *5/20*
U.S. Cl. 251—159 3 Claims



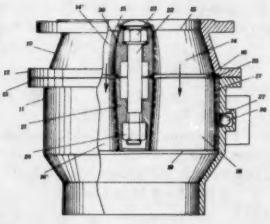
A downstream seat for a ball valve has a collar or piston which slides longitudinally in the valve body and is forced against the ball to move the ball into sealing engagement with a stationary upstream sealing element. The piston is externally actuated, either mechanically or hydraulically.

3,653,632

FLUID DYNAMIC PROFILE

Livio Meloni, Via Assisi, n. 29, Rome, Italy

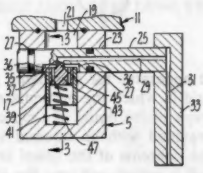
Filed June 15, 1970, Ser. No. 46,194
Int. Cl. F16k *1/22*
U.S. Cl. 251—304 4 Claims



Profiles of surfaces of bodies subject to relative motion in a fluid are designed on the ground of particular relationships

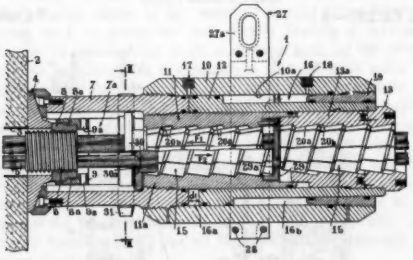
between the elements involved when the optimum performance in the interaction between body and fluid is desired. A profile is disclosed for a rotary valve which coaxially connects two sections of a water pipeline, for closing, opening and regulating the water flow from upstream to downstream, the inner surface of suitable passageways which are evenly distributed about the axis of the rotary valve being suitably shaped.

3,653,633
VALVE
Charles D. Striplin, Box 515, Benica, Calif.
Filed July 14, 1970, Ser. No. 54,744
Int. Cl. F16k *31/524*
U.S. Cl. 251—354 **1 Claim**



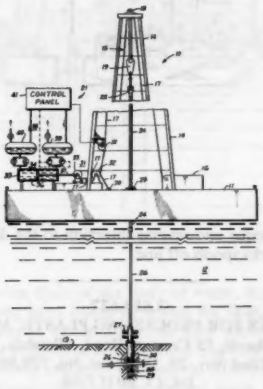
A spring mounted valve having a dispensing arm is provided wherein the arm is hollow and serves both as an outlet for the valve and as a control arm for the valve. A spring actuated plunger serves both as a shut off mechanism for the valve and as a spring to return the valve to the closed position. The valve is particularly adapted for dispensing glue in a box making operation.

3,653,634
STEPWISE-OPERATING POWER APPARATUS
Rene Bechi, Bois Colombes, France, assignor to Societe des Grands, Travaux de Marseille, France
Filed Oct. 23, 1970, Ser. No. 83,534
Int. Cl. E21b *19/00*
U.S. Cl. 254—29 A **9 Claims**



Hydraulic power apparatus operating stepwise and comprising essentially a body having arranged therein a fixed retaining device, an annular piston and a movable traction device connected to the tubular rod of said piston, said fixed retaining device and said movable traction device comprising clamping members adapted to grip and release by turn cables, rods or the like, the clamping members of one device gripping the cables when the clamping members of the other device release said cables, and vice-versa. The invention may be used either as a traction ram when it is held in a fixed position for exerting a tractive effort, for example on a cable for prestressing a concrete mass, or as a "re-advancing" device for displacing step-by-step a mass or load to which it is connected along a rail-forming cable or rod.

3,653,635
WAVE MOTION COMPENSATING APPARATUS FOR USE WITH FLOATING HOISTING SYSTEMS
Howard J. Bates, Jr., Houston, Tex., and Ado Vujasinovic, Fullerton, Calif., assignors to Joe Stine Inc., Houston, Tex.
Filed Nov. 17, 1969, Ser. No. 877,096
Int. Cl. B66d *1/48*
U.S. Cl. 254—172 **4 Claims**

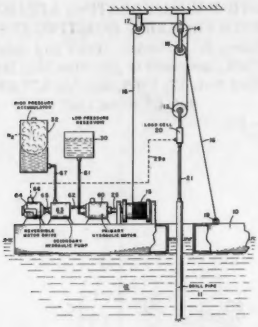


The dead end of the drilling line of the hoisting system of a floating drilling rig makes multiple passes between a stationary sheave assembly and a movable sheave assembly and then runs to a dead line anchor to which it is tied. A piston mechanism including a cylinder, piston, and piston rod is located on the floating rig structure and is coupled to the movable sheave assembly for controlling the spacing between the stationary and movable sheave assemblies. Fluid control apparatus communicates with the piston mechanism for controlling the fluid pressure therein for minimizing variations in the drilling line tension as the floating drilling rig or other type of floating structure rises and falls with the sea waves. The piston rod is subject to a pure tension load at all times, thereby enabling the rod to be of any suitable length to accommodate any wave height encountered.

3,653,636
WAVE MOTION COMPENSATION SYSTEM FOR SUSPENDING WELL EQUIPMENT FROM A FLOATING VESSEL
George R. Burrell, Houston, Tex., assignor to Esso Production Research Company
Filed Feb. 9, 1970, Ser. No. 9,764
Int. Cl. B66d *1/48*
U.S. Cl. 254—173 **4 Claims**

A reversible hydraulic motor and a high pressure-low pressure hydraulic reservoir system are used to counterbalance the weight of a drill string or other well equipment suspended from a line wound on a draw works positioned on a floating vessel. A load cell controls the torque output and the direction of the output drive of the hydraulic motor and in turn torque on and the direction of rotation of the draw works. On downward movement of the floating vessel high pressure hydraulic fluid from an accumulator moves through the hydraulic motor into a low pressure hydraulic fluid reservoir to provide increased torque to the draw works as the draw works spools up line and upward movement of the floating vessel the hydraulic motor reverses and becomes a

pump and moves low pressure fluid from the low pressure reservoir to the high pressure accumulator to provide



decreased torque and reverse direction to the draw works as the draw works spools off line.

3,653,637

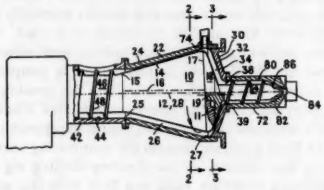
APPARATUS FOR PROCESSING PLASTIC MATERIALS

Hans A. Eckhardt, 55 Crescent Road, Allendale, N.J.

Filed Nov. 29, 1968, Ser. No. 779,805

Int. Cl. B01f *7/08*

U.S. Cl. 259—7 **22 Claims**



An apparatus and method of extruding, injection molding, blow molding and transfer molding plastic materials comprise a feed screw rotating in a barrel and feeding plastic material over a revolving member surrounded by an increasing and a decreasing housing with a discharge opening at its center. The revolving member has an increasing surface with a center line which has a radial distance to the axis of revolution of that member. The revolving member has a subsequent decreasing surface with a center line which has a radial distance to the member's axis of revolution diametral to the radial distance from the center line of the increasing surface to that axis of revolution, so that the forces developed in an area of decreasing surface are compensated by forces in a diametral area of increasing surfaces. The increasing surfaces diverge from each other as do the decreasing surfaces. The increasing housing, the decreasing housing and the revolving member are axially movable relatively to each other to vary the spaced relationship between their surfaces. For extrusion, an extrusion barrel is attached to the decreasing housing, and an extrusion screw to the revolving member. For molding operations, an injection screw or an injection piston extends through a bore in the revolving member coaxial with the member's axis of revolution.

3,653,638

METHOD AND APPARATUS FOR DISPERSING A SOLID MATERIAL IN A LIQUID

William E. Showalter, Seal Beach, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed June 18, 1970, Ser. No. 47,361

Int. Cl. B01f *15/02*

U.S. Cl. 259—4 **19 Claims**

A method and apparatus for dispersing particles of solid material in a liquid in which the particulate solid material is placed in a reservoir of the liquid in a closed vessel having a bottom outlet provided with an internal vertical standpipe through which the contents of the vessel are withdrawn and wherein the liquid is introduced into the vessel at an angle normal to and adjacent the open terminus of the standpipe. The concentration of solid particles in the withdrawn liquid is controlled by adjusting the velocity of the liquid introduced into the vessel, an increase in inlet velocity causing a decrease in the particle concentration. Where the particles are buoyant, the standpipe extends to the top of the vessel and the liquid is introduced at that point. In the case of non-buoyant particles, a short standpipe is employed that terminates near the bottom of the vessel and the liquid is introduced adjacent thereto.

3,653,639

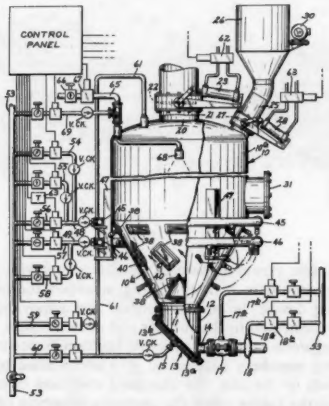
HIGH PRESSURE AIR AND LIQUID BLENDING METHOD AND APPARATUS FOR DISCRETE MATERIALS

Marvin C. Mueller, Lesueur, Minn., assignor to Whirl-Air-Flow Corporation, Minneapolis, Minn.

Filed Feb. 4, 1971, Ser. No. 112,568

Int. Cl. B01f *15/02*

U.S. Cl. 259—4 **7 Claims**



A closable vessel is shown having a funnel-shaped lower portion with an outlet opening at the bottom end. Aerator pads and air jet fittings are mounted on the inner wall of the

lower portion to fluidize and blend discrete materials in the vessel. A water spray nozzle is mounted within the vessel near the center thereof to spray a predetermined amount of water into the discrete materials during the blending cycle. A diffuser pad is mounted at the outlet opening to aid in fluidizing the materials during blending and to aid in causing the blended materials to flow from the vessel into an outlet conduit for transporting to a remote location.

3,653,640

APPARATUS FOR PREPARING AND DISPENSING A MIXTURE OF AT LEAST TWO LIQUIDS

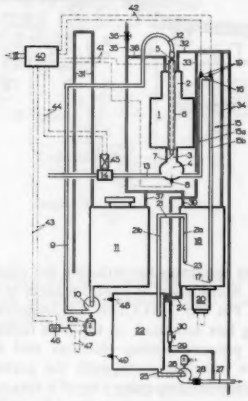
Hendrik Antoon Lorentz deHaas, Loenersloot, Netherlands, assignor to Berg & Burg N.V., Breukelen, Netherlands

Filed May 29, 1969, Ser. No. 829,050

Claims priority, application Netherlands, June 6, 1968, 6807971

Int. Cl. B01f *15/00;* **B01d** *13/00;* **C02b** *1/82*

U.S. Cl. 259—4 **16 Claims**



An apparatus for preparing and dispensing a dialysate for an artificial kidney by mixing a concentrated salt solution with softened water in the required mixing ratio, having a mixing tank, a pump for periodically feeding a measured quantity of concentrate from a storage tank to the mixing tank, an inlet conduit comprising a shut-off type valve for feeding water to the mixing tank after the concentrate has been pumped into this tank and a loop-shaped syphon discharge tube for discharging the mixed liquid from the mixing tank. The upper loop portion of the syphon tube is arranged adjacent the upper portion of the mixing tank and contains two electrodes of a liquid responsive control circuit which controls the shut-off valve to close this valve at the moment the liquid reaches the level of said loop portion and thereby starts to flow out of the mixing tank through the syphon discharge tube.

3,653,641

AERATOR AND WATER TREATMENT DEVICE

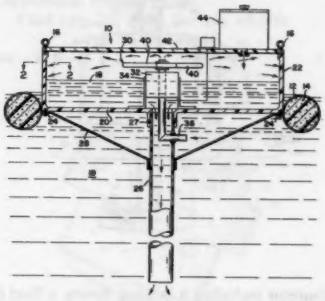
Robert E. Eron, 3375 34th N., St. Petersburg, Fla.

Filed Oct. 16, 1970, Ser. No. 81,209

Int. Cl. B01f *3/04*

U.S. Cl. 261—18 **14 Claims**

A floating liquid aerator and water treatment device adapted for use in aerating and chemical treatment of polluted water. The device includes an axial flow impeller rotated by motor means disposed above a centrally located tube. The motor and impeller, pump water upwardly through the tube and sling it outwardly for interface contact with the particular surrounding atmosphere. The impeller slings the water into the atmosphere with considerable turbulence thereby exposing more of the water surface to the atmosphere, resulting in a higher transfer of oxygen or other gas to the water. The base of the floating aerator includes an extended tube which communicates between the interior of the floating liquid aerator and a point beneath the float near



or just above the floor of the body of water. As the aerated or treated water head builds up within the float, the aerated or treated water is forced down the tube thereby causing a gentle flow of aerated or treated water outward and upward near the bottom of the body of water. In addition, means are provided to chemically treat the aerated water whereby the chemicals will be thoroughly dispersed and diluted before being exposed to the environment.

3,653,642

CARBURETTORS

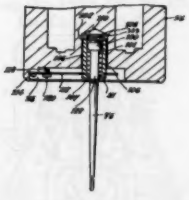
Geoffrey Lloyd Lawrence, Potters Bar, England, assignor to The Zenith Carburetter Company Limited, Stanmore, Middlesex, England

Filed Oct. 16, 1969, Ser. No. 866,939

Claims priority, application Great Britain, Oct. 22, 1968, 50,104/68

Int. Cl. F02m *1/10*

U.S. Cl. 261—39 B **4 Claims**



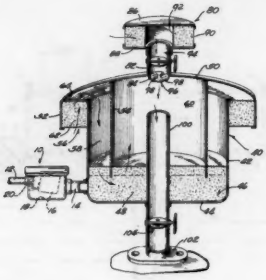
The invention provides an air valve carburettor wherein the contoured needle is mounted for axial movement relative to the suction operated member and temperature sensitive control means are provided and associated between said contoured needle and said suction operated member whereby the cross sectional area of the jet orifice is determined by the temperature sensed by the temperature sensitive control means which temperature will be influenced inter alia by the temperature of the incoming fuel, the temperature of the air passing beneath the air valve and the temperature of the engine.

3,653,643

CARBURETOR

Oliver M. Tucker, 1613 East Blackthorne Pl., Milwaukee, Wis.

Filed Apr. 3, 1970, Ser. No. 25,362
Int. Cl. F02m 17/34
U.S. Cl. 261—56 6 Claims



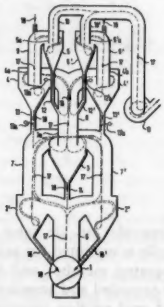
A carburetor including a housing having a fluid fuel reservoir in the bottom, an air inlet at the top of the housing, a delivery pipe coaxially mounted within the housing and terminating short of the top of the housing, and a porous vaporizing filter substantially filling the reservoir. A baffle is concentrically mounted within said housing and extends partially into the vaporizing filter in the reservoir to deflect the incoming air through the vaporizing filter. The level of liquid fuel in the reservoir is kept above the bottom of the baffle, so that air entering the carburetor through the inlet must pass through the liquid fuel and vaporizing filter in the reservoir before discharge through the outlet. A secondary air inlet is provided in the top of the housing for controlling the fuel air ratio of the vaporized fuel passing into the delivery pipe.

3,653,644

APPARATUS FOR PREHEATING FINE GRANULAR MATERIAL

Jochen Polysius, and Horst Ritzmann, both of Neubeckum, Germany, assignors to Polysius AG, Neubeckum, Germany

Filed May 28, 1970, Ser. No. 41,199
Claims priority, application Germany, Aug. 12, 1969, P 19 41 045.8
Int. Cl. F27b 15/00
U.S. Cl. 263—21 A 7 Claims



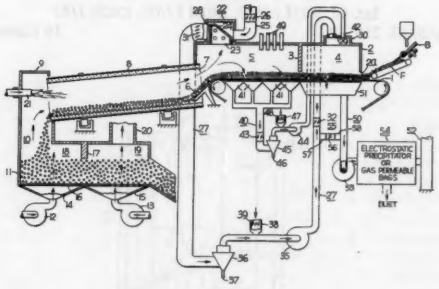
A plurality of eddy chambers of the cyclone separator type are arranged in superimposed levels through which the material passes downward in series and through which the hot gases travel upward in series. Each eddy chamber is provided with a duct for discharging material separated in the chamber. The material discharge duct of each eddy chamber in at least the uppermost level is provided with a shutoff valve, and the material discharge duct of each eddy chamber in at least the lowermost level is constructed without any shutoff valve.

3,653,645

METHOD AND FURNACE FOR HEAT TREATING MATERIALS

Glenn A. Heian, Franklin, Wis., assignor to Allis-Chalmers Manufacturing, Milwaukee, Wis.

Filed Dec. 10, 1970, Ser. No. 96,775
Int. Cl. F27b 7/02
U.S. Cl. 263—32 R 12 Claims



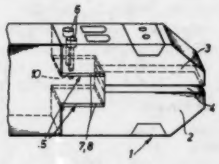
A method and apparatus for reducing the alkali content of cement clinker is disclosed as improvements to a system according to U.S. Pat. No. 3,313,534. The improved system includes a mixing box mounted on top of a furnace structure that defines a preconditioning chamber and a preburning chamber over a traveling grate, with the preburn chamber adjacent a material inlet opening end of a rotary kiln. A portion of the hot gases coming from the kiln and passing into the preburn chamber are drawn into the mixing box where such gases are mixed with atmospheric air and bypassed away from the material in the preburn chamber while the remainder of the hot gas coming from the kiln is permitted to pass through the material in the preburn chamber. Withdrawing some of the gases from the preburn chamber unloads most of the dust and some of the volatilized alkalies from the system. This hot dust laden gas is mixed with atmospheric air in the mixing box to drop the temperature from about 2,000° Fahrenheit to below the freezing temperature of the alkalies, which for NaOH and KOH would be below 600° Fahrenheit. This immediate quenching of the gas in the mixing box freezes alkali to very small particles, most of which are smaller than 10 to 20 microns, that do not then deposit on inner surfaces of a bypass conduit or on material in the preconditioning chamber. The other gas flow, passing through the material in the preburn zone, transfers heat to the material therein and this gas drops in temperature to an average temperature of about 500° to 750° Fahrenheit. This gas that has passed through the material in the preburn chamber after tempering with atmospheric air if necessary to lower the temperature to 500–600° Fahrenheit and the gas that has bypassed the preburn chamber may then be directed through one or more cyclone dust collectors to remove the dust particles larger than 10 to 20 microns and a minor portion of the frozen alkalies and then delivered to a preconditioning chamber in which the material is treated (i.e., dried) before passing into the preburn chamber. One or more auxiliary burners are mounted in the top of the furnace structure between the mixing box and the preconditioning chamber, to make up any heat deficit in preburn gases. Bypassed gases

and preburn gases with entrained dust and alkali particles smaller than 10 to 20 microns are delivered to the preconditioning chamber and drawn through the material and into exhaust conduit means connected to the preconditioning chamber between the preburn chamber and the material inlet end of the preconditioning chamber. Provision is made for withdrawing controlled amounts of the bypassed gas directly to the exhaust conduit means, without such amounts passing through the material in the preconditioning chamber. A fine dust collector, which may be an electrostatic precipitator or gas permeable bags, is connected to the exhaust conduit means. The fine dust collector collects dust smaller than 10 to 20 microns, including a major portion of the alkalies.

3,653,646
FLAME SCARFING TORCH

Albert Jager, Rommelhausen, Germany, assignor to Messer Griesheim GmbH, Frankfurt am Main, Germany

Filed Nov. 12, 1969, Ser. No. 876,010
Claims priority, application Germany, Dec. 23, 1968, G 68 12 833.6
Int. Cl. B23k *7/00*
U.S. Cl. 266—23 T **7 Claims**

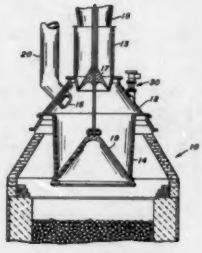


A flame scarfing nozzle for a flame scarfing torch includes a stratified plate between the nozzle halves to control the size of the flame scarfing slot.

3,653,647
BLAST FURNANCE TOP CONE AND STEAM CONTROL NOZZLE ASSEMBLY

Hugh B. Carr, McMurray, and Norman F. Bradel, Scott Township, Carnegie, Pa., assignors to S. P. Kinney Engineers, Inc., Carnegie, Pa.

Filed Aug. 5, 1970, Ser. No. 61,104
Int. Cl. C21b *7/00*
U.S. Cl. 266—31 **10 Claims**

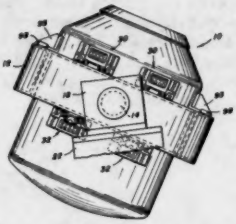


A blast furnace top cone and steam control nozzle assembly including a housing mounted on the cone and having an end opened to the confines of the top cone. A nozzle member is supported by the housing at the open end thereof. A stop member is disposed in the housing and is engageable with the nozzle member for selectively opening and closing the nozzle. The steam is shut off at its point of injection into the blast furnace thereby preventing the hot blast furnace gases from entering the housing to cause damage therein. Also, shutting off the steam at the nozzle eliminates a need for a separate steam shutoff valve upstream of the nozzle.

3,653,648
SUPPORT ASSEMBLY FOR A TILTABLE HOT METAL PROCESSING VESSEL

Ernst A. Mevissen, Robinson Township, Allegheny County, and Stanley M. Coulter, Wexford, both of Pa., assignors to Dravo Corporation, Pittsburgh, Pa.

Filed Aug. 20, 1970, Ser. No. 65,649
Int. Cl. C21c *5/50*
U.S. Cl. 266—36 P **9 Claims**

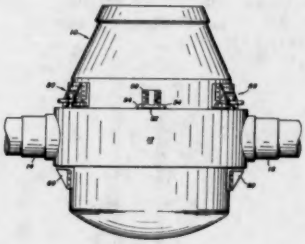


A support assembly for a tiltable hot metal processing vessel, including a trunnion ring encircling the vessel, and upper and lower support brackets fixed to the vessel. The upper support brackets are arranged to engage bearing surfaces on the upper portion of the trunnion ring. The lower brackets are provided with inclined bearing surfaces sloped downwardly and outwardly from the upright vessel. The lower surface of the trunnion ring is provided with inclined support surfaces which confront the bearing surfaces of the lower brackets, and which slope downwardly and outwardly but diverge outwardly with respect to the bearing surfaces of the lower brackets. Wedge pieces are disposed between and engage the lower support surfaces of the trunnion ring and the bearing surfaces of the lower brackets.

3,653,649
SUPPORT ASSEMBLY FOR A TILTABLE HOT METAL PROCESSING VESSEL

Ernst A. Mevissen, Robinson Township, Allegheny County, and Stanley M. Coulter, Wexford, both of Pa., assignors to Dravo Corporation, Pittsburgh, Pa.

Filed Aug. 20, 1970, Ser. No. 65,650
Int. Cl. C21c *5/50*
U.S. Cl. 266—36 P **10 Claims**



A support assembly for use with a hot metal processing vessel, including a plurality of upper primary brackets fixed to the vessel at spaced intervals thereabout, each of the brackets having laterally extending trunnion-ring engaging

bottom portions. A trunnion ring is provided in spaced relationship to an intermediate section of the vessel, and is arranged to have sliding contact with the ring-engaging portions of the primary brackets. The primary brackets have T-shaped pockets at the lower ends thereof, which pockets are sized to receive similarly shaped lugs fixed to the upper surface of the trunnion ring. Wear strips are detachably fixed to the lugs and disposed between the sides of the lugs and the confronting surfaces of the pockets of the brackets.

3,653,650

METHOD OF CONTROLLING THE EXHAUST GAS FLOW VOLUME IN AN OXYGEN TOP-BLOWING CONVERTER

Norito Iwao; Akira Ito; Minoru Maeda; Tadashi Kawaguchi, and Nakano Nobukuni, all of Kitakyushu, Japan, assignors to Yawata Iron & Steel Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1969, Ser. No. 886,823
Claims priority, application Japan, Dec. 27, 1968, 43/96013
Int. Cl. C21c *5/40*
U.S. Cl. 266—35 **2 Claims**

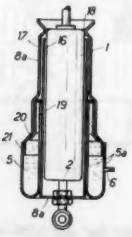
A method for correctly judging the carbon value of a steel bath by controlling an exhaust gas flow produced from an oxygen top-blowing converter, wherein the exhaust gas flow is controlled so that the momentary flow volume of the exhaust gas flowing through an exhaust gas conduit may coincide with the variation with the lapse of time of a dry gas flow volume in a standard state predetermined in response to blowing conditions and a decarburizing velocity is calculated from the said exhaust gas flow volume and the analysis value of the exhaust gas.

3,653,651

SUSPENSION SYSTEMS FOR VEHICLES

Fernand Michel Allinquant, and Jacques Gabriel Allinquant, both of 53, Avenue Le Notre, 92 Sceaux, France

Filed Mar. 27, 1970, Ser. No. 23,186
Claims priority, application France, Mar. 31, 1969, 6909643; Oct. 2, 1969, 6933701
Int. Cl. F16f *5/00, 9/04*
U.S. Cl. 267—64 B **15 Claims**



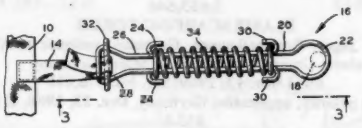
A suspension device for a vehicle wherein a telescopic damper, having a cylinder and a piston carried by a piston rod emerging through a seal at one end of the cylinder, is laterally surrounded by a deformable enclosure which can be supplied with fluid at an adjustable pressure, whereby at least partly to support the weight of the vehicle, the wall of the deformable enclosure being arranged to isolate the supplied fluid from the seal through which the piston rod emerges from the cylinder.

3,653,652

POOL COVER

Albert W. Lindberg, Jr., 179 W. 5th St., Bayonne, N.J.

Filed June 25, 1969, Ser. No. 836,257
Int. Cl. F16f *1/12*
U.S. Cl. 267—71 **2 Claims**



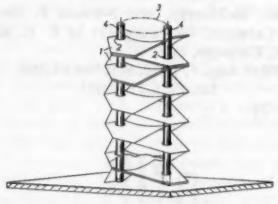
A tension bar for securing an article to an abutment and including a coiled tension spring and two oppositely facing U-shaped members enclosed by the spring. A loop or one member at a first end of the bar secures the bar to a fixed abutment and wedge-like attaching member at a second end of the bar securing the article to a second member. The opposite ends of the members are secured at the ends of the spring which is put under tension when the members are pulled in opposite direction.

3,653,653

PRING OF STACKED DISHED PLATES

Otto Muhlhauser, Berhausen, Germany, assignor to Gesellschaft Fur Kernforschung MBH, Karlsruhe, Weberstasse, Germany

Filed July 17, 1970, Ser. No. 55,932
Claims priority, application Germany, Aug. 6, 1969, P 19 40 012.5
Int. Cl. F16f *1/34*
U.S. Cl. 267—165 **5 Claims**



Improvements in a spring made up of a multiplicity of stacked, curved plates attached to each other and supporting each other along opposite edges whereby the turning potential of the spring is decreased, which improvement comprises providing a bolt through a bore in each of the plate of the spring located between the center and an edge of each plate.

3,653,654

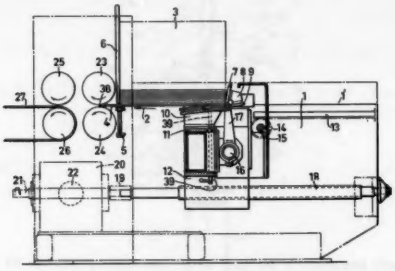
ARRANGEMENT IN AND RELATING TO MACHINES FOR MANUFACTURING CARTON BLANKS

Stig Martin Carlsson, Orebro, Sweden, assignor to Sunds Aktiebolag, Sundsvall, Sweden

Filed June 18, 1970, Ser. No. 47,329
Claims priority, application Sweden, June 27, 1969, 9175/69
Int. Cl. B65h *1/06*
U.S. Cl. 271—44 **4 Claims**

An arrangement in machines for manufacturing carton blanks, said machines being of the type in which the carton

sheets are fed intermittently therethrough and are passed from a magazine to a conveying means by means of a reciprocating feed means, wherein the feed means are individually journalled on a support surface and constructed in



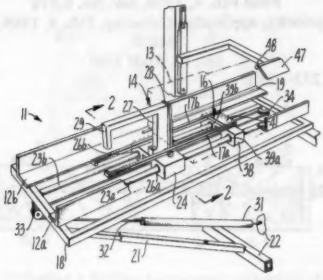
he form of a feed stand and provided with means by which the feed means can be quickly and reliably adjusted to the different sizes of carton sheet material passing through the machine.

3,653,655

SUPPORT CARRIAGE

Charles D. Striplin, Box 515, Benica, Calif.

Filed June 24, 1970, Ser. No. 49,292
Int. Cl. B65h *1/00*
U.S. Cl. 271—62 B **3 Claims**



A support carriage for use in a magazine for supporting and advancing upstanding panels in a column to a processing station and providing reduced drag on the supporting surfaces. The magazine includes a pair of guide rails and a pushing member, spring biased to push the panels along the rails. The pushing member is journaled with low friction bearings on geared guide shafts. An intermediate support carriage is similarly journaled on said guide shafts forward of the pusher and has elevated support rails extending rearward thereof to lateral bearing supports on the pusher member. The panels are loaded in the magazine with a portion supported on the guide rails and a portion on the support rails of the carriage such that the pusher has to overcome the drag between only one set of rails and one portion of panels at a time.

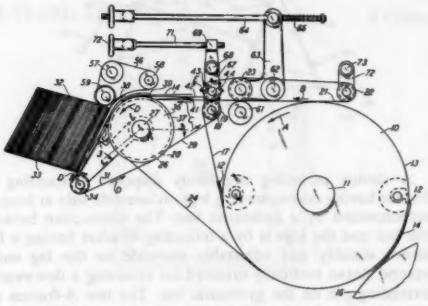
3,653,656

METHOD AND MEANS OF SHEET IMBRICATING AND STACKING

Anton R. Stobb, Pittstown, N.J., assignor to Stobb, Inc., Mountainside, N.J.

Filed Apr. 10, 1970, Ser. No. 27,325
Int. Cl. B65h *29/18*
U.S. Cl. 271—68 **8 Claims**

A method and means of sheet imbricating and stacking of flexible sheets, such as signatures processed and delivered by a folder. A conveyor receives the sheets from the folder and delivers the sheets to another conveyor which moves at a speed less than the speed of the first conveyor. The slow moving conveyor deposits the sheets on a bed where the sheets are aligned in a stack. The first conveyor supports the sheets from underneath, and the first conveyor has a projection which holds the sheets upwardly relative to the remainder of the conveyor so that clearance is provided between the sheets and the remainder of the conveyor. Also, a brush is disposed adjacent the conveyor for brushing the



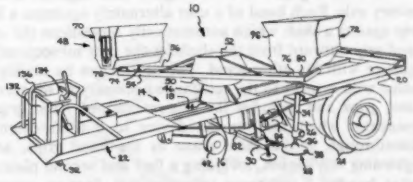
trailing edge of the sheets upwardly. The projection and the brush are for the purpose of providing a space between the sheets and the remainder of the conveyor so that the oncoming sheets can be disposed underneath the sheets already on the first conveyor, and the sheets can therefore be taken from a spaced-apart relationship as they approach the first conveyor and then placed in an imbricated relationship on the first conveyor. The first conveyor then passes the imbricated related sheets to the second conveyor, and the sheets can then be stripped directly off the second conveyor and formed into a stack.

3,653,657

SELF-CONTAINED AMUSEMENT RIDE

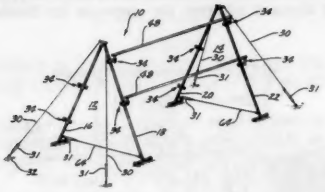
Richard W. Bishop, 4563 Lewis Ave., Toledo, Ohio

Filed Feb. 4, 1971, Ser. No. 112,707
Int. Cl. A63g *1/08*
U.S. Cl. 272—29 **10 Claims**



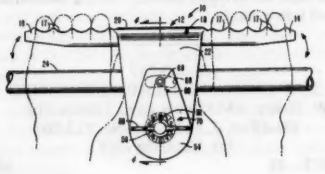
An amusement ride is provided which is self-contained. All of the components and elements of the ride are mounted on or are a part of a single trailer. The trailer can be readily towed to a given location and the ride readied for operation by one operator in a matter of a few minutes. As such, the ride is particularly adaptable for smaller fairs and carnivals of short duration. Further, the one-man operation results in substantial labor savings, such costs otherwise rendering many rides unprofitable. The trailer is complete with a loading and unloading platform and entrance and exit ramps adjacent an operator's station.

3,653,658
ADJUSTABLE GYMNASTIC BAR SUPPORTED BY A-FRAMES
William E. Robertson, 7211 Bryn Mawr Drive, Des Moines, Iowa
Filed Feb. 12, 1970, Ser. No. 10,813
Int. Cl. A63b *3/00*
U.S. Cl. 272—63 **6 Claims**



A device including oppositely disposed upstanding A-frames having corresponding legs on one side side at least interconnected by a gymnastic bar. The connection between the bar and the legs is by a mounting bracket having a first sleeve slidably and adjustably movable on the leg and a second sleeve vertically oriented for receiving a downwardly extending pin on the gymnastic bar. The two A-frames and mounting brackets may be appropriately used with different types of gymnastic devices.

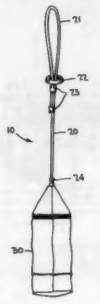
3,653,659
WRIST EXERCISER DEVICE
Harold Zinkin, Fresno, Calif., assignor to Whittaker Corporation
Filed Aug. 20, 1970, Ser. No. 65,369
Int. Cl. A63b *21/30*
U.S. Cl. 272—68 **8 Claims**



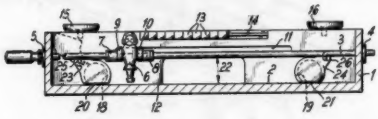
An improved wrist exerciser device with a pair of pivotally mounted hand grips which are rigidly held together along a unitary axis. Each hand of a user alternately squeezes a hand grip against a shaft which automatically repositions the other hand grip outward from the shaft for the user subsequently to squeeze with his other hand. The device can be readily adjusted with respect to the resistance necessary to squeeze the hand grips and includes the aforementioned hand grips, a connector which secures the device to a shaft extending therethrough in the same plane as the hand grips, and a tightening mechanism, including a first and second plate, the latter bearing a resistance indicator dial, friction imparting disc, and pivot mounting.

3,653,660
METHOD OF LEARNING OR IMPROVING THE TENNIS SERVE
Farouk S. Malhas, Washington, D.C., assignor to Tennis Promotion, Inc., Washington, D.C.
Filed Mar. 17, 1970, Ser. No. 20,332
Int. Cl. A63b *69/38*
U.S. Cl. 273—29 A **3 Claims**

A device for use in learning, practising, and perfecting a tennis serve comprising a flexible, substantially non-elastic tether and a weighted end portion is described. The tether is grasped at one end and swung forward using the motion associated with the exaggerated throwing of a baseball. The weighted end of the device forces the smooth, continuous follow-through motion required in a tennis serve.



3,653,661
PENALTY OPENINGS WITH PIVOTED COVERS IN SOCCER TABLES
Xaver Leonhart, 8381 Harburg, Harburg near Landau/Isar, Germany
Filed Feb. 4, 1970, Ser. No. 8,576
Claims priority, application Germany, Feb. 4, 1969, G 69 05 046.0
Int. Cl. A63f *7/06*
U.S. Cl. 273—85 D **5 Claims**

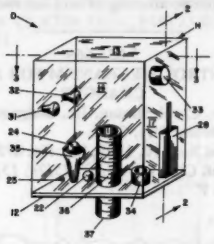


A generally rectangular table soccer game having raised side walls and end walls with goal openings or areas centrally located in the opposite end walls, and penalty openings in the end walls on opposite sides of the goal openings adapted to receive a misdirected or foul ball and deposit it in a cup exterior of the table by means of a passageway connecting the penalty opening and the cup. Each goal opening is provided with a cover member pivotally connected to the end wall.

3,653,662
MAGNETICALLY ACTUATABLE PROJECTILE AND TARGET GAME
Dale K. Welbourn, Neola, Iowa
Filed May 28, 1970, Ser. No. 41,274
Int. Cl. A63b *63/00*
U.S. Cl. 273—95 R **5 Claims**

An amusement device comprising a hollow shell-like housing and having selected wall portions of magnetically-impermeable and of transparent structural material, at least one magnetically-permeable pellet loosely disposed within the housing and droppably releasable with a permanent magnet from a magnetically-impermeable housing wall into open-ended receptacle-like targets disposed within the housing. The targets may be of different shapes and sizes and may be

disposed on more than one wall of the housing. One target is adjustable to vary its distance from the opposite wall. There



may be several pellets and these may be of different diameters.

3,653,663

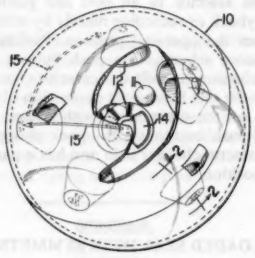
SPHERICAL SHELL GAME APPARATUS HAVING INTERNAL CUPS AND A FREELY MOVEABLE BALL

Benjamin Kinberg, 425 Riverside Drive, New York, N.Y., and Richard J. Mayer, Bloomfield, N.J.

Filed July 31, 1969, Ser. No. 846,329

Int. Cl. A63f 9/06

U.S. Cl. 273—96 R **8 Claims**



A game including a hollow transparent spherical shell having a loose ball confined therein and a plurality of consecutively numbered cups within the shell. The object of the game is to transfer the ball from one cup to another in consecutively numbered order.

3,653,664

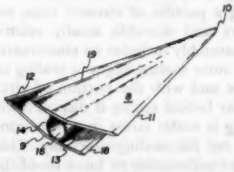
BROAD HEAD ARROWHEAD

Gerald F. Gentellalli, 8817 La Mesa Blvd., La Mesa, Calif.

Filed May 11, 1970, Ser. No. 36,075

Int. Cl. F41b 5/02

U.S. Cl. 273—106.5 B **1 Claim**



A broad head arrowhead having two substantially flat, opposite surfaces converging toward a point; the surfaces being separated by a tapered cylinder in the center of the arrowhead for the reception of a shaft; a first side of the one flat surface extending beyond a first side of the second flat surface and a second side of the second flat surface extending beyond the second side of the first flat surface providing air pressures for causing rotation and stability.

3,653,665

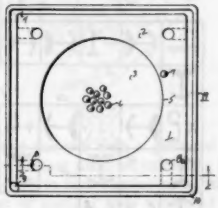
SURFACE PROJECTILE GAME APPARATUS

Eric C. Wahlberg, 32 Eighth St., Stamford, Conn.

Filed Mar. 26, 1970, Ser. No. 22,980

Int. Cl. A63f 7/00

U.S. Cl. 273—125 R **6 Claims**



A game wherein a plurality of first bodies such as balls or discs are positioned within a first area having a limiting boundary and surrounded by a second area from which a second body is propelled into contact with the first bodies to drive the first bodies from the first area. Holes in the surface of the second area may be provided to receive the bodies driven in their direction. A trough type receptacle surrounding the outside of the second area may be used to receive balls from the first and second areas. Scoring may be in accordance with the number of bodies driven from the first and second areas, the number which enter the holes and accordance with corresponding color coded bodies and holes. The bodies generally include spheres, balls and discs.

3,653,666

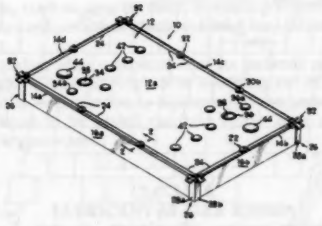
POOL TYPE GAME

Gordon A. Barlow, Evanston, and Jeffrey D. Breslow, Chicago, both of Ill., assignors to Marvin Glass & Associates

Filed Apr. 13, 1970, Ser. No. 27,951

Int. Cl. A63f 3/00

U.S. Cl. 273—126 R **8 Claims**



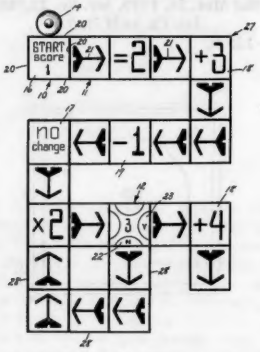
A game apparatus including a game board with removable surface portions and cup portions insertable therein from the underside of the board. The game further includes playing pieces which are to be shot into the cups and an element for shooting the playing pieces for travel across the playing board towards the cups. In addition, members are provided to be assembled about the periphery of the board to provide a confining structure therefor.

3,653,667

GAME APPARATUS FOR FAMILIARIZING THE USER WITH THE FORMATION OF COMPUTER FLOW CHARTS

Eugene H. Primoff, New Rochelle, N.Y., assignor to Worldwide Computer Services Inc., Hartsdale, N.Y.

Filed June 29, 1970, Ser. No. 50,600
Int. Cl. A63f 3/02
U.S. Cl. 273—134 D 1 Claim



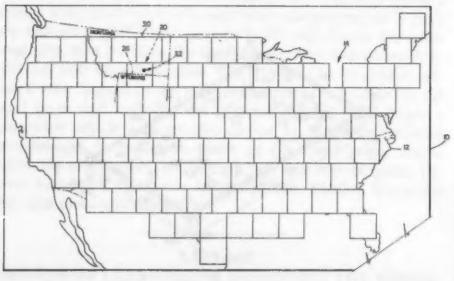
A game apparatus useful for familiarizing the user with the formation of computer flow charts, said apparatus comprising a first plurality of playing pieces having positive or negative scoring values, a second plurality of playing pieces having directional indicia thereon, a third plurality of playing pieces having different indicia thereon positioned to indicate different directions, and a random selection die having on each face one of said different indicia. The pieces are assembled by the user in flow chart orientation, and his score is then computed as he advances a scoring piece over the chart, said score depending upon the user's skill in arrangement of the chart, and the function of the random selection die.

3,653,668

BOARD GAME APPARATUS

Blaise F. Santianni, 807 Glenview St., Philadelphia, Pa.

Filed Feb. 2, 1970, Ser. No. 7,563
Int. Cl. A63f 3/00
U.S. Cl. 273—135 AE 11 Claims



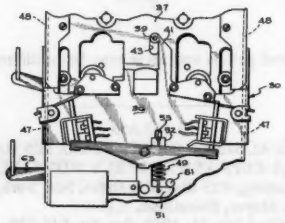
Indicia on a playing surface represent a geographic area divided into a plurality of similarly shaped units. Correspondingly shaped pieces are provided for each unit having thereon indicia relating said pieces to said area by a place, event or the like having historical, geographical or like interest in a precise manner so that each of said pieces has a predetermined position on said surface. Preferably some of said pieces have geographical indicia thereon which coact with the indicia of adjacent pieces to define geographic boundaries, at least one group of adjoining pieces having portions of a continuous line thereon, said line serving to check the accuracy of the positioning of said last mentioned pieces.

3,653,669

PAUSE CONTROL MECHANISM FOR A CASSETTE CHANGER

Glenn E. Sterly, Carol Stream, Ill., assignor to Ampex Corporation, Redwood City, Calif.

Filed Nov. 10, 1969, Ser. No. 875,307
Int. Cl. G11b 23/12, 15/24, 15/29
U.S. Cl. 274—4 F 3 Claims



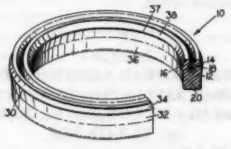
A manually operable play/record selector and pause selector operate a control mechanism in a manner which interrupts a playback or recording operation merely by operation of the pause selector to an operated position and which resumes playback or recording merely by return of the pause selector from the operated position. Preferably, the pause and play/record selectors are push buttons and cause the control mechanism to shift the cassette changer to a pause position, on the one hand, with depression of the pause push button and, on the other hand, with release of a depressed play/record push button to its upper unoperated position. Thus, the cassette changer is in and has a pause position for its normal position.

3,653,670

SPRING-LOADED SEAL WITH SYMMETRICAL CROSS SECTION

Elie C. Sifri, and Steve W. H. Wu, both of Portland, Oreg., assignors to Cascade Corporation, Portland, Oreg.

Filed May 11, 1970, Ser. No. 36,292
Int. Cl. F16j 15/32
U.S. Cl. 277—164 2 Claims



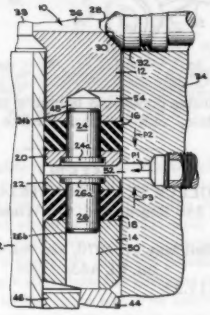
A sealing assembly forming a fluid tight seal between a first member having a cylindrical bore therein and a second member having a portion of circular cross section disposed within the bore and movable axially relative to the first member. The assembly includes an elastomeric annular body with inner and outer sealing edges in sealing contact with the cylindrical bore and with the portion of circular cross section. An annular helical spring is disposed within said body, and such spring is under stress in a direction extending circumferentially on the sealing assembly. This stress of the spring operates continuously to force on of the sealing edges into firm contact with the member that the edge contacts. This one sealing edge forms a dynamic seal in the construction, and the other sealing edge forms a static seal in the construction.

3,653,671

SELF-ENERGIZING WELL PACKOFF

Kelly V. Shipes, Houston, Tex., assignor to FMC Corporation, San Jose, Calif.

Filed Oct. 23, 1968, Ser. No. 769,776
Int. Cl. E21b *33/02*; F16j *15/02*
U.S. Cl. 277—103 13 Claims



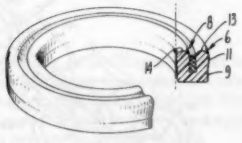
A well packoff for installing in the annulus between a well casing head and an inner concentric pipe to establish and maintain a fluid-tight seal therebetween, regardless of the well pressures to which the tool is subjected. The packoff includes a pair of resiliently deformable seal rings arranged to receive an axially directed pressure, significantly increase it to a predetermined degree, and then exert that increased pressure against the casing head and pipe.

3,653,672

SEAL RING

Maurice D. Felt, Carson City, Nev., assignor to Sacomo Sierra Inc.

Filed July 13, 1970, Ser. No. 54,464
Int. Cl. F16j *15/24*
U.S. Cl. 277—205 4 Claims



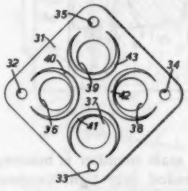
A seal ring is provided having rounded lips wherein the top point of sealing is below the top of the ring and the ring has a large area in contact with the sealing surface. The seal ring may have a hollow center portion or a filler strip may be employed in the center of the ring. The filler strip, if used, is of rectangular configuration.

3,653,673

GASKETS

Dermot Green, Cheltenham, England, assignor to Dowty Seals Limited, Ashchurch, Tewkesbury, Gloucestershire, England

Filed Nov. 2, 1970, Ser. No. 85,979
Claims priority, application Great Britain, Nov. 19, 1969, 56,613/69
Int. Cl. F16j *15/10*
U.S. Cl. 277—227 12 Claims



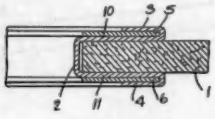
A gasket suitable for use with a gasketed joint assembly having a strip of a sealant material extending from part of an area subjected in use to high loading to another part of that area or to a part of another area subjected to use to high loading.

3,653,674

JACKETED GASKET

Gerd Von Bennigsen, Geisenbrunn Post Gilching, Germany, assignor to Reinz Dichtungs-Gesellschaft m.b.H., Neu-Ulm Donau, Germany

Original application Sept. 28, 1967, Ser. No. 671,442, now Patent No. 3,549,157. Divided and this application Dec. 21, 1970, Ser. No. 99,851
Claims priority, application Germany, Sept. 13, 1966, R 44250
Int. Cl. F16j *15/02*
U.S. Cl. 277—231 18 Claims



Jacketed gasket with at least one of its legs folded over for at the most half of its width, the fold being at a distance from the bend of the jacket which is at least equal to the thickness of the gasket in the non-compressed state.

Inserts, such as annular disks, washers, wires of metal and synthetic resin, or other plastic material may be inserted into the fold.

The gasket, after compression of its jacketed part has the advantage that no flowing out or squeezing out of the gasket material on compression or tightening of the gasket between the surfaces to be sealed can take place. Thus satisfactory sealing is guaranteed.

3,653,675

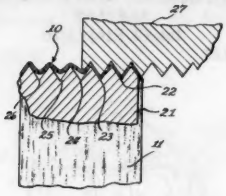
LUBRICANT-SEALER RIBBON

William L. Schaefer, Palatine, Ill., assignor to Felt Products Mfg. Co.

Filed Nov. 24, 1969, Ser. No. 879,307
Int. Cl. F16j *15/14*
U.S. Cl. 277—235 11 Claims

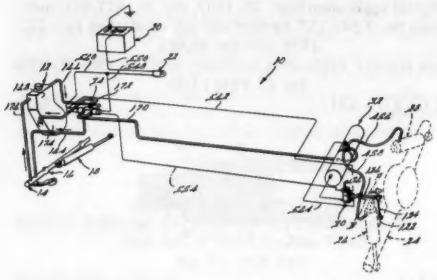
A lubricating and sealing ribbon is provided for forming a sealed joint between male and female threaded members. The ribbon comprises a matrix of a soft thermoplastic polymer oriented in the longitudinal direction of the ribbon and filled with lubricant particles.

In use, the ribbon is wrapped around the threads of the male joint for at least one turn, the ribbon is stretched transversely to conform to the contour of the male threads and



then the wrapped male member is inserted into the female member and threaded into tight connection. During the threading, the ribbon is distorted and compressed to fill the space between the male and female threads.

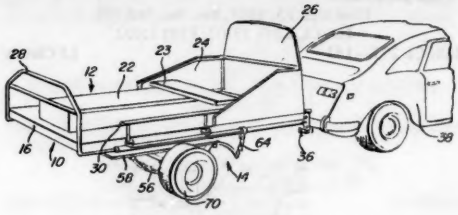
3,653,676
VEHICLE LEVELING SYSTEM
William W. Higginbotham, Monroe, Mich., assignor to Monroe Auto Equipment Co., Monroe, Mich.
Continuation of Ser. No. 722,506, Jan. 8, 1968, now Patent No. 3,539,744. This application Mar. 23, 1970, Ser. No. 21,714
Int. Cl. B60g *17/04*
U.S. Cl. 280—6 P **23 Claims**



A leveling system for a vehicle comprising sprung and unsprung portions, a fluid operated leveling device for selectively varying the attitude between said vehicle portions, a source of actuating fluid, pump means for pumping fluid from said source thereof to said leveling device, a fluid accumulator including means defining first and second variable volume chambers at least in part defining therebetween a third chamber communicable with said fluid source and said leveling device, and means for controlling operation of said pump means in response to volume changes in at least one of said chambers.

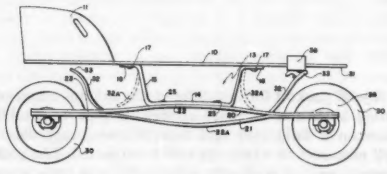
3,653,677
TRAILER SNOW SLED
Emmett John Feser, P.O. Box 115, Rockyford, Alberta, Canada
Filed Oct. 14, 1969, Ser. No. 866,246
Claims priority, application Canada, Aug. 18, 1969, 059,762
Int. Cl. B62b *13/18*
U.S. Cl. 280—8 **5 Claims**

A trailer type vehicle having an undercarriage longitudinally adjustably attached to a load carrying body and convertible to provide sled runner supporting assemblies or wheeled supporting assemblies to enable the vehicle to be



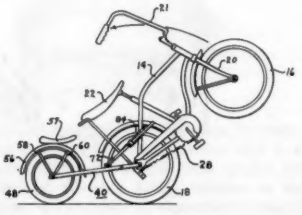
used under various conditions behind a towing vehicle such as a "snowmobile," automobile or the like.

3,653,678
ROLLER SKATE CONSTRUCTION
Ralph Collett, 356 Regent Ave. W., Winnipeg 25, Manitoba, Canada
Filed May 27, 1970, Ser. No. 40,916
Int. Cl. A63c *17/06*
U.S. Cl. 280—11.23 **11 Claims**



A sole plate has a leaf spring construction underneath to which the wheels are mounted. Check means are provided to prevent the sole plate from rubbing on the wheel rims and an easily operated positive toe catch is incorporated in the sole plate.

3,653,679
BICYCLE ATTACHMENT AND COMBINATION
James N. Howard, 12361 E. Colby Drive, Mishawaka, Ind.
Filed Nov. 21, 1969, Ser. No. 878,660
Int. Cl. B62d *63/00*
U.S. Cl. 280—32.7 **8 Claims**



An attachment for a bicycle having a wheel positioned rearwardly on the bicycle and a frame connecting the wheel to the rear axle of the bicycle for pivotal movement of the bicycle relative to the attachment. The attachment includes a fixture and an abutment means which limits the angular movement between the bicycle and the attachment when the forward end of the bicycle is reared upwardly. A seat and fender may be mounted on the attachment above the wheel

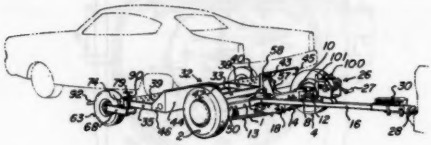
and two closely spaced wheels may be used in place of a single wheel in the attachment.

3,653,680

TOW TRAILER WITH FOLDING CARRIER PLATFORM

Donald I. Denny, La Crosse, Wis., assignor to Toter, Inc., La Crescent, Minn.

Filed Sept. 18, 1970, Ser. No. 73,392
Int. Cl. B60p 3/06; B62d 53/04
U.S. Cl. 280—34 A 10 Claims



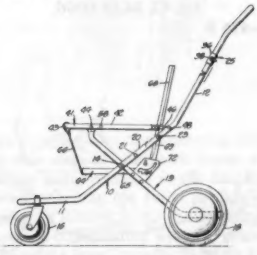
A vehicle tow trailer is provided with a vehicle carrier platform supported at its outer end by swivel wheels and having its inner end pivotably supported from the trailer axle for swinging movement about a horizontal axis, whereby said platform may be folded over from a rearwardly extending position of use to a forwardly disposed position wherein an elevated rest on the trailer draw bar supports the platform in overlying relation to the draw bar. The carrier platform is wider than the space between the wheels on opposite ends of the trailer axle, and a pair of laterally spaced support arm structures extending rearwardly from the trailer axle pivotally support the platform at such a location rearwardly of the trailer wheels that the platform clears the trailer wheels when in its rearwardly extending position of use or in its forwardly collapsed storage position.

3,653,681

BABY STROLLER

Julian A. Virtue, 2 Bowie Road, Rolling Hills, Calif.

Filed May 19, 1970, Ser. No. 38,837
Int. Cl. B62b 11/00
U.S. Cl. 280—36 B 8 Claims



A baby stroller having as an integral part of its structural framework a shock absorbing mechanism to cushion the ride of the infant passenger, and having a foldable frame for ease of storage or transport which includes an improved safety latching system to prevent accidental folding.

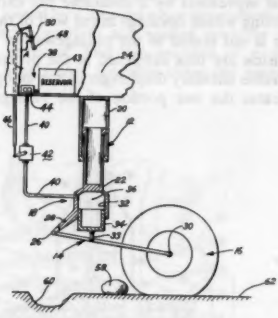
3,653,682

ENERGY ABSORBING DEVICE

Roy M. Palmer, and Francis M. Kobayashi, both of South Bend, Ind., assignors to The Bendix Corporation

Filed Apr. 17, 1970, Ser. No. 29,571
Int. Cl. B60g 11/26
U.S. Cl. 280—124 F 10 Claims

An energy absorbing device comprising: a primary energy absorber, lever means operatively connected to the primary energy absorber, a wheel rotatably carried by the lever means, and a secondary energy absorber operatively interposed between the primary energy absorber and the lever means. The secondary energy absorber includes a variable



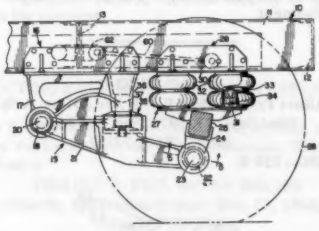
volume fluid chamber and a valve for communicating the chamber with a fluid pressure source. The secondary energy absorber is responsive to relatively large vertical deflections of said wheel to minimize the effect thereof on said primary energy absorber means.

3,653,683

VEHICLE SUSPENSION SYSTEM

Robert T. Hendrickson, Lyons, Ill., assignor to Hendrickson Mfg. Co., Lyons, Ill.

Filed May 18, 1970, Ser. No. 38,385
Int. Cl. B60g 11/26
U.S. Cl. 280—124 F 9 Claims



A vehicle axle suspension which may be employed in a single or multiple axle arrangement and which is characterized by a rigid elongate mounting arm disposed at each side of the vehicle frame with its forward end pivoted to a bracket depending from the frame and its trailing end connected to the wheel axle beneath an air cushion which is interposed between the axle and the frame and a snubber-like force absorbing device connecting an intermediate portion of the mounting arm with the frame at a point spaced rearwardly of the pivoted end of the mounting arm.

3,653,684

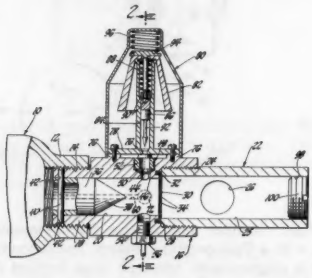
PRESSURE VESSEL VALVE ASSEMBLY

Roy D. Plumer, Santa Barbara, Calif., assignor to General Motors Corporation, Detroit, Mich.

Filed June 18, 1970, Ser. No. 47,200
Int. Cl. B60r 21/10
U.S. Cl. 280—150 AB 5 Claims

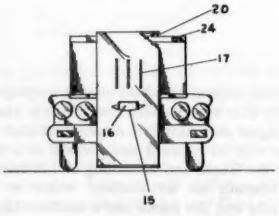
A pressure vessel for an inflatable restraint cushion contains superatmospheric fluid. The vessel opens to an annular

passageway which in turn opens radially for communication with the cushion adjacent a closed end thereof. The passageway is sealed intermediate its ends by a rupturable main diaphragm. A slidable piston is located within the passageway adjacent the pressure vessel and is normally held against movement by a shearable pin carried by the piston and fitting within openings in the wall of the passageway. The piston is not sealed to the passageway so that both faces of the piston are thus subjected to the pressure of the fluid. A rupturable auxiliary diaphragm closes an opening which communicates the one portion of the passageway between the



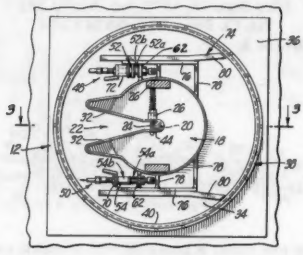
piston and main diaphragm with the atmosphere. An acceleration responsive sensor is mounted on the passageway and, upon receiving an acceleration pulse of predetermined amplitude and time, releases an operator to rupture the auxiliary diaphragm and vent the one portion of the passageway to atmosphere. The differential pressure drives the piston along the passageway and through the main diaphragm to rupture this diaphragm and communicate the cushion with the pressure fluid for inflation thereof. A metal plug at the closed end of the passageway is engaged by the piston to arrest its movement.

3,653,685
SCALD SHIELD
Thomas Albert Friend, 7934 E. 4th Ave., Mesa, Ariz.
Filed Sept. 23, 1970, Ser. No. 74,646
Int. Cl. B60r *27/00*
U.S. Cl. 280—150 R **1 Claim**



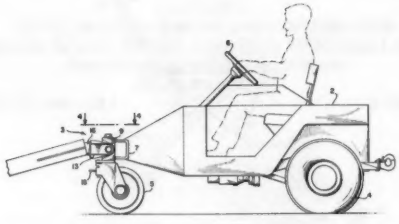
A device designed to prevent scalding of the hands of a person servicing an overheated automobile radiator or the like, said device having substantially the form of an apron being made of steam resisting sheet material, and comprising suction cups to fasten it to the top of the radiator hood, gravity means at the bottom of the sheet to hold it in place against the force of the wind, a pouch to hold a towel or asbestos glove and to surround and protect the hand of the user, and one or more vertical slots in said sheet to permit the insertion of the hand of the user to release the safety latch of the hood. The pouch is so constructed that it permits the hand of the user to reach for the radiator cap and to unscrew the same while the pouch surrounds his hand.

3,653,686
FIFTH WHEEL COUPLING FOR TRACTOR-TRAILER VEHICLE
David J. Roesies, 16127 Francisquito Ave., La Puente, Calif.
Filed Apr. 17, 1970, Ser. No. 29,546
Int. Cl. B62d *53/08*
U.S. Cl. 280—421 **8 Claims**



A fifth wheel coupling for a tractor-trailer vehicle including a fifth wheel plate to be rockably mounted on the tractor, a turntable plate to be rotatably mounted on the trailer, means releasably joining the plates in coupled relation, wherein the table plate rests on and is coupled to the wheel plate, and mating conduit coupling parts mounted on the plates for relative movement into and from mating engagement upon relative movement of the plates into and from coupled relation. The mating conduit coupling parts may constitute an electrical coupling for transmitting electrical power between the tractor and trailer and a hose coupling for transmitting pressure fluid, such as braking air, between the tractor and trailer.

3,653,687
ARTICULATED VEHICLE COUPLING
John P. Forsyth, and Robert W. Forsyth, both of Upland, Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.
Filed Sept. 24, 1970, Ser. No. 75,119
Int. Cl. B62d *13/00*
U.S. Cl. 280—476 R **6 Claims**

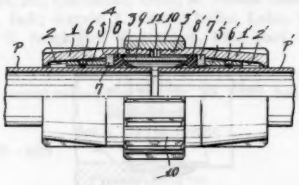


An articulated vehicle coupling having axes of yaw, pitch and roll, and wherein a caster spindle and caster wheel are mounted on the yaw axis.

3,653,688
PIPE COUPLING DEVICE
Akira Sakakibara, 861 Horiuchi, Hayamamachi, Miura-gun, Kanagawa-ken, Japan
Filed Apr. 22, 1970, Ser. No. 30,708
Claims priority, application Japan, Feb. 28, 1970, 45/20181
Int. Cl. F16l *17/00*
U.S. Cl. 285—105 **4 Claims**

A device for coupling or decoupling pipe sections including two hollow cylindrical members each having a tapered

inner surface portion and adapted to receive a pipe section. Several metallic balls are disposed between the tapered inner surface portion and a portion of the outer surface of the pipe section for acting as wedge means to prevent separation of the cylindrical member and the pipe section. Sealing means are located between the cylindrical member and its associated pipe section for providing an air-tight seal between the two. Fastening means are disposed between the hollow cylindrical members for moving the hollow members toward each other and for urging the sealing means against the inner surface of the hollow cylindrical members and the outer surface of the pipe sections to be joined.

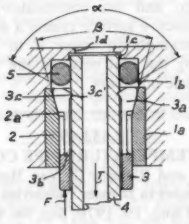


3,653,689

RELEASABLE COUPLING FOR FLUID CARRYING TUBES

Jacques Sapy, Valence, and Andre Legris, St-Maur, both of France, assignors to Ste. Legris, Ozoir-la-Ferriere, France

Filed May 6, 1970, Ser. No. 35,215
Claims priority, application France, May 3, 1969, 6917467
Int. Cl. F16l *17/00*
U.S. Cl. 285—113 **10 Claims**



A releasable coupling for a fluid-carrying tube comprises a socket having four stepped concentric bores, a collar having a conical surface being retained in the first bore. Mounted for axial movement within the collar is a clamping member having a plurality of flexible jaws. The clamping member has an inclined surface co-operating with the conical surface on the collar to force the jaws inwardly to clamp a tube received in the socket. A packing ring is retained in the second bore, and the third and fourth bores serve to locate the tube.

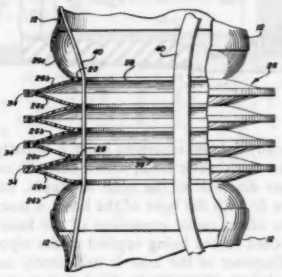
3,653,690

SAFETY GARMENT JOINT AND METHOD OF MAKING SAME

Antoine Robert Treveiler, and Elroy E. Wilke, both of Palatine, Ill., assignors to Standard Safety Equipment Co.

Filed Sept. 14, 1970, Ser. No. 71,827
Int. Cl. F16l *21/00*
U.S. Cl. 285—226 **18 Claims**

A complete enclosure garment for use in areas containing hazardous liquid or gaseous medium, the garment protecting a workman while conforming to the workman's size so as to provide maximum mobility commensurate with total protection against ambient liquid and gas environment. The garment has novel expansible portions built into appendage covering portions of the garment, and including a novel method of fabricating such portions. The expansible portions are of the accordion type and are fabricated by providing pairs of flat disc shaped sections of relatively thin plastic material. The two sections of each pair thereof are placed in juxtaposition and joined by a circular sewn seam about a central aperture locating position and spaced inwardly of the periphery of the sections. The two sections of each pair thereof then are heat sealed together along the seam. The



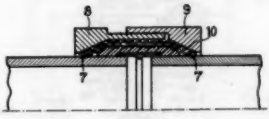
pairs of joined and sealed sections then are placed in juxtaposition and adjacent sections of adjacent pairs thereof are joined by second circular sewn seams spaced outwardly from the first seams. A reinforcing strip of thin plastic material is placed over the outer seams on the outside of each of the joined sections and the strips and sections are heat sealed together to provide gas and liquid impervious seams. A central aperture is cut out of the pairs of joined sections and the pleated expansible portion formed thereby is joined and sealed in the garment.

3,653,691

CONNECTING DEVICE FOR PIPES AND APPLICATIONS THEREOF

Georges Eugene Bram, Pont-A-Mousson, France, assignor to Centre de Recherches de Pont-A-Mousson, Pont-A-Mousson, France

Filed Dec. 8, 1969, Ser. No. 883,188
Claims priority, application France, Dec. 17, 1968, 178593
Int. Cl. F16l *19/00*
U.S. Cl. 285—236 **15 Claims**

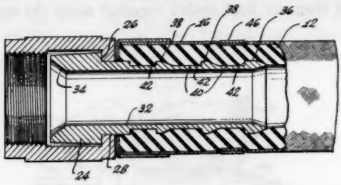


Connecting device for interconnecting two tubular elements of piping at least one of which has a tubular smooth end portion. The device comprises a flexible and resiliently yieldable sealing sleeve which overlaps the smooth end portion. A withdrawable ring of hard material is interposed between the sleeve and outer axially movable means having an inner tapered clamping face. The outer means radially clamps the sealing sleeve on the smooth end portion through the withdrawable ring which binds the sleeve and has an end embedded in the smooth end portion.

3,653,692
HOSE COUPLING METHOD AND MEANS

John W. Henson, 57 East Providencia, Burbank, Calif.

Filed Feb. 9, 1970, Ser. No. 9,893
Int. Cl. F16l 33/00
U.S. Cl. 285—242 18 Claims

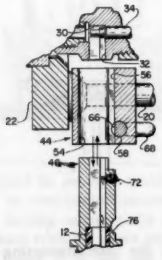


An integrally formed clamping band is initially offset from an end of an elastomeric hose, with a close fit on the relaxed normal outer diameter of the hose. A nipple, adapted for an interference fit with the bore of the hose, is inserted into the hose end to effect radial expansion of the hose bore. Upon axially opposed forces being applied to the nipple and hose, the outer diameter of the hose is sufficiently contracted for the cylindrical band to be freely movable along the contracted hose into a final clamping position over and around the nipple. Upon relaxation of the tension, the clamping band maintains clamping compression of the embraced section of the hose end of the nipple. In the case of braid reinforced hose, the braided reinforcement radially contracts the elastomeric hose wall material into tighter engagement with the nipple, upon the hose being subjected to tension. As an alternative to inducing tension in the hose, and after the nipple has been inserted into the hose end, the nipple and clamping band may be relatively oppositely moved to effect relative translation of the clamping band into final clamping position.

3,653,693
TUBULAR CONNECTOR HAVING SPRING BIASED COUPLING MEANS

Howard N. Wieland, Amherst, and Don E. Ehrlich, Huron, both of Ohio, assignors to TRW Inc., Cleveland, Ohio

Original application Sept. 10, 1965, Ser. No. 486,296, now Patent No. 3,418,441. Divided and this application Dec. 20, 1968, Ser. No. 851,766
Int. Cl. F16l 37/14
U.S. Cl. 285—317 3 Claims

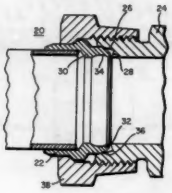


A quick release coupling for use with a welding apparatus including a body member for receiving a male fitting. The fitting has a longitudinally extending spline which fits into a longitudinally extending groove formed in a passage of the body member. A spring biased locking pin is carried by the body member and is positioned transversely of the passage to engage a shoulder on the fitting to couple the fitting to the body member.

3,653,694
TUBE COUPLING ASSEMBLY

John Nicol, Palos Verdes Peninsula, Calif., assignor to Teledyne, Inc., Los Angeles, Calif.

Filed June 24, 1970, Ser. No. 49,452
Int. Cl. F16l 19/00
U.S. Cl. 285—334.4 7 Claims

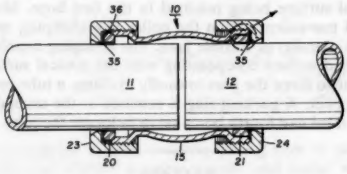


A tube coupling assembly is disclosed which includes a tubular male coupling member having a sealing lip and including a nose at the end of the sealing lip, an outer sealing surface and an inner concave surface. A female coupling member is provided which includes an inner inwardly tapering seating surface adapted to receive the sealing surface of the male member and which also includes a shoulder portion extending inwardly from the tapered seating surface. The male member is placed in the female member and secured thereto by a conventional nut and thread arrangement. The nut is tightened until an adequate seal is obtained between the sealing surface of the male member and the seating surface of the female member, in a conventional manner. However, if the nut is over-torqued, thereby attempting to force the male member to penetrate too far into the female member, the nose of the sealing lip bottoms against the shoulder member, and the combination of the resultant forces and the concave surface create a moment in the sealing lip which attempts to cause it to buckle outwardly, thereby increasing the seal between the mating surfaces of the male and female members.

3,653,695
HIGH TEMPERATURE PIPE COUPLING

John T. Dunton, and Richard G. Van Houtte, both of Bradford, Pa., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 19, 1970, Ser. No. 64,956
Int. Cl. F16l 19/08
U.S. Cl. 285—340 6 Claims



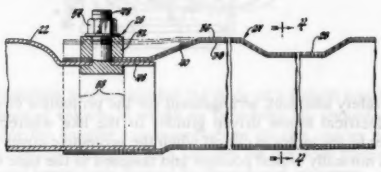
A coupling member for joining plain end pipe and adapted for maintaining sealing pressure throughout a swing range of temperatures between about normal room temperature to on the order of 300° F. and above. A cylindrical sleeve is provided for overlying opposite pipe ends and is outwardly flared at its ends to define annular cavities in which to receive annular gaskets. Thimble-nuts screw threaded to the exterior of each sleeve end compress the gasket thereat radially and axially inward of the cavity to effect a required gasket sealing pressure. By a predetermined space relation of cavity and gasket the latter when fully compressed, will consume less than the available axial extent of the cavity. The

unused axial cavity extent at room temperature permits unstressed gasket expansion as temperatures increase.

3,653,696
LAMINATED PIPE EXHAUST CONDUIT WITH LOW PRESSURE SEAL JOINT

Thomas R. Cassel, Birmingham, Mich., assignor to Kenneth W. Cassel, Jr., Cincinnati, Ohio; R. Nelson Cooksey, Indianapolis, Ind.; Keevin J. Cassel, Union Lake, Mich. and William E. Neighbors, Petersburg, Fla., part interest to each

Filed Nov. 18, 1969, Ser. No. 877,742. The portion of the term of the patent subsequent to Mar. 30, 1988, has been disclaimed.
Int. Cl. F16l *39/00*
U.S. Cl. 285—403 9 Claims

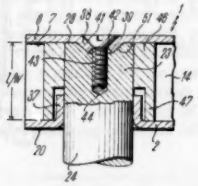


An exhaust conduit for automotive internal combustion engines is disclosed wherein a low-pressure seal joint between pipe sections is used with a laminated pipe to avoid failures of the laminated pipe which have been experienced with prior art joints. The laminated pipe includes at the interface of the laminations a residual quantity of oil-like material which is used in the manufacturing process. When used in an exhaust system with a high-pressure seal joint the material vaporizes under the influence of the hot exhaust gases and the vapor pressure thereof causes separation of the laminations, collapse of the inner lamination or other failure of the pipe. A low-pressure seal over a band of engagement in the joint is effective to prevent leakage of the exhaust gases and at the same time to allow vaporized material between the laminations to escape through the end of the laminated pipe.

3,653,697
PREFABRICATED JOINT

Herbert Ernst, Wartbergsteige 109, 71 Heilbronn, Germany

Filed Aug. 12, 1969, Ser. No. 849,416
Claims priority, application Germany, Aug. 16, 1968, P 17 84 553.9
Int. Cl. F16b *7/00*
U.S. Cl. 287—56 11 Claims

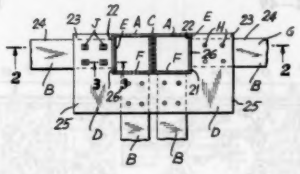


A joint for connecting two or more structural elements at an angle to each other. At least a first of these elements is of a tubular shape, preferably of a rectangular cross section, and provided with an aperture in its wall through which the end of a second element is inserted so as to abut directly or indirectly against the inside of the wall of the first element at a point opposite the aperture where the inserted end of the second element is additionally secured either directly or indirectly to the wall of the first element. The two elements may either be welded directly to each other or be interconnected by an additional supporting member which may be inserted into and welded to the first element and then braces the opposite wall portions of the latter against each other. This supporting member forms a socket into which the end of the second element may be inserted.

3,653,698
CONNECTOR STRUCTURE FOR MODULAR BUILDING ASSEMBLIES

Myron Jenner, c/o Jen Products, Inc., Bethel, Vt.

Filed Feb. 11, 1970, Ser. No. 10,367
Int. Cl. E04c *3/30*; F16b *2/18*
U.S. Cl. 287—189.36C 4 Claims



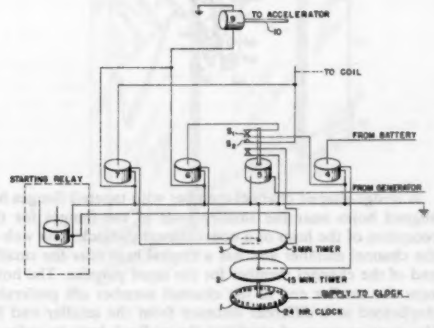
The disclosure sets forth a connector useful in assembly and erection of multistory modular buildings from modules including hollow corner columns of rectangular cross section interconnected by horizontal beams.

The connector comprises a flat U-shaped yoke member which brackets two single columns of adjacent modules and has one leg of the U fixedly mounted on the top or bottom surface of an adjacent beam while the other leg is connected to the corresponding flange of an adjacent beam with the aid of bolts and conical or wedge-shaped camming members exerting a clamping effect upon a tightening of the bolts so as to draw the columns close together and to rigidify the structure.

3,653,699
AUTOMATIC ENGINE STARTER SYSTEM INCLUDING MEANS FOR RELEASING THE FAST IDLE CAM

William L. Podesta, Bon Air Farms, R.R. 3, and Charles R. Miles, Jr., 804 S. 16th St., both of Mattoon, Ill.

Filed July 22, 1970, Ser. No. 57,082
Int. Cl. F02n *11/00*
U.S. Cl. 290—37 14 Claims



An automatic engine starter including a plurality of timer means operable to selectively energize electrical relays in a predetermined sequence to affect sequential operation of the engine accelerator and starting relay to start the engine at a

predetermined time. The timer means includes means for repeating a cranking cycle of the engine a predetermined number of times if the engine fails to start on the first attempt.

3,653,700

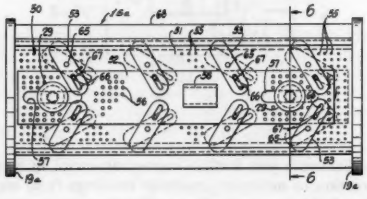
COVERS FOR PLATING BARRELS AND THE LIKE

Thomas R. Gill, Cleveland, Ohio, assignor to G S Equipment Company

Original application Feb. 23, 1967, Ser. No. 618,070, now Patent No. 3,507,529, dated Apr. 21, 1970. Divided and this application Oct. 29, 1969, Ser. No. 872,338. The portion of the term of this patent subsequent to Apr. 21, 1987, has been disclaimed.

Int. Cl. E05c *3/02*

U.S. Cl. 292—49 10 Claims



A cover for plating barrels having a closure panel which carries locking structure for engaging the barrel in more than one location along the sides of the panel. The locking structure along at least one side of the closure panel is operated by movement of a single member carried by the panel.

3,653,701

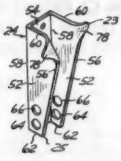
GATE LATCH LOCKING DEVICE

Louis A. Harvey, 15107 Ilene, Detroit, Mich.

Filed Nov. 4, 1970, Ser. No. 86,741

Int. Cl. E05c *19/06*

U.S. Cl. 292—87 9 Claims



A wedge-shaped channel member with tapered flanges has aligned holes near the smaller ends of the flanges for the reception of the hasp of a conventional padlock. The web of the channel member also has a central hole near the smaller end of the channel member for the same purpose. The holes near the smaller end of the channel member are preferably duplicated at a different distance from the smaller end for the same purpose of receiving the padlock hasp in order to adapt the device to gate latches of different dimensions. Outwardly projecting wings are preferably provided at the larger end corners where they serve not only as handles facilitating withdrawal of the device but also as stops for widening the device when installed in the gate.

3,653,702

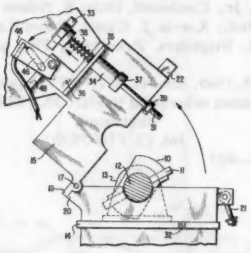
SAFETY LOCK DEVICE

Herbert H. Frimberger, Middlefield, Conn., assignor to Polymer Machinery Corp., Berlin, Conn.

Filed Nov. 12, 1970, Ser. No. 88,647

Int. Cl. E05c *5/04*

U.S. Cl. 292—251 10 Claims



A safety interlock arrangement for the protective cover of an electrical motor driven grinder or the like whereby the power to the motor is cut off when the protective cover is not in its normally closed position and fastened to the base of the grinder. The interlocking arrangement includes a screw which is mounted on the side of the protective cover and which engages the base or support for the grinder to lock the protective cover in its closed position. A bearing block, containing a mercury switch which controls the power input into the electric motor, is pivotally mounted on the side of the protective cover so that it normally rests against the free end of the screw. In order to disengage the screw from the base, the bearing block must be pivoted to a position wherein the mercury switch is open, thus disconnecting the power from the electric motor.

3,653,703

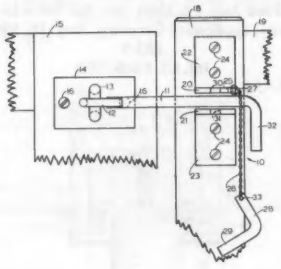
SAFETY HOOK LATCH

Clarence J. Lochner, R.R. 1, Box 18, Peosta, Iowa

Filed Dec. 3, 1970, Ser. No. 94,840

Int. Cl. E05c *19/10*

U.S. Cl. 292—106 10 Claims



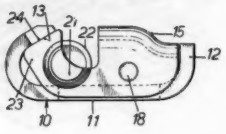
A safety hook latch with a hook member mounted on a gate positionable between spaced parallel plates mounted on a gate post for a latched state with a safety latch lock pin inserted through the spaced parallel plates maintaining the hook member in a latch captured state. The safety latch lock pin is suspended by a mounting chain from the upper plate mounted on the gate post with the mounting chain located to present a positive reminder by being an obstacle to positioning of the hook member to the latched state to insure safety latch lock insertion of the pin.

3,653,704

FASTENING MEANS FOR THE DOORS OF FREIGHT CONTAINERS, TRANSPORT VEHICLES AND THE LIKE

John Charles Hawkins, North Walsall, England, assignor to Rubery, Owen & Co., Limited, Darlaston, Wednesbury, Staffordshire, England

Filed July 24, 1970, Ser. No. 58,092
Claims priority, application Great Britain, July 26, 1969, 37,656/69
Int. Cl. E05c 3/04
U.S. Cl. 292—218 4 Claims



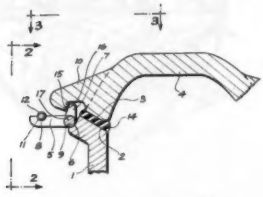
In fastening mechanism for the door of a freight container or transport vehicle in which an operating bar mounted on the door for angular movement about its axis carries on its ends cams co-operating with keepers on the door frame the cams and keepers are formed by sheet metal pressings.

3,653,705

CONSTRUCTION FOR FLUID TIGHT JOINTS

Charles Harold Warman, Castlecrag, Australia, assignor to Warman Equipment (International) Ltd., Belmont, Australia

Filed Oct. 21, 1970, Ser. No. 82,695
Claims priority, application Australia, Oct. 23, 1969, 62721/69
Int. Cl. B65d 45/32; E05c 7/00
U.S. Cl. 292—256.65 5 Claims



A fluid-tight joint formed between at least two adjoining members wherein matching tapered annular joint faces are provided on the members to be jointed, a plurality of bell-crank levers is provided each arranged with one arm thereof adapted to engage a segmental lug on one of the adjoining members, and a tension ring circumscribes the other arms of the bell-crank levers with contraction of the tension ring serving to bring the adjoining members into sealing engagement.

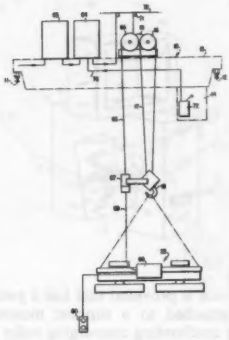
3,653,706

LIFTING MAGNET FOR HANDLING CARGOS

Shinichi Kashiwagi, Takasago; Morio Amano, and Koichi Nakasawa, both of Himeji, all of Japan, assignors to Nishishiba Electric Co., Ltd., Himeji, Japan

Filed July 14, 1970, Ser. No. 54,786
Int. Cl. B66c 1/04
U.S. Cl. 294—65.5 7 Claims

A lifting magnet for handling cargoes which includes an elongated pole piece rotatably attached to a framework suspended from a suspension device such as the hook of a cargo crane. The elongated pole piece is rotatably mounted on the framework for being rotated in a plane relative thereto. Thus, when the elongated pole piece is positioned on a plurality of elongated cargos such as I-beams with the longitudinal axis of the pole piece crossing the longitudinal axes



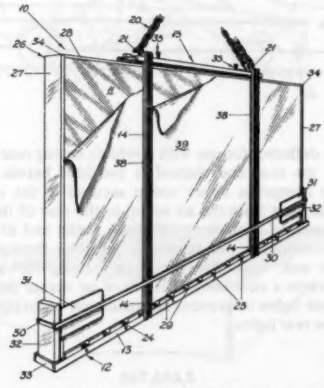
of the I-beams, it is possible to lift a plurality of I-beams at the same time. On the other hand, when the elongated pole piece is rotated and positioned on only one I-beam with the longitudinal axes thereof being aligned, it is possible to lift only the selected I-beam.

3,653,707

FLAT GLASS SHIPPING CASE

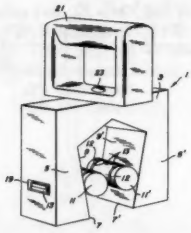
Frank L. Pile, Manteca, and Earl J. Olson, Lathrop, both of Calif., assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Oct. 3, 1969, Ser. No. 863,441
Int. Cl. B66c 1/16
U.S. Cl. 294—67 D 9 Claims



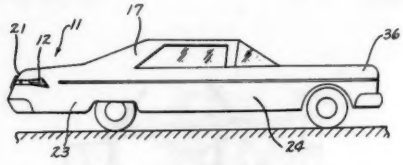
A reusable case for shipping and storing frangible sheets. The case is formed from stock components which can be assembled in various ways so as to accommodate different numbers of sheets of various dimensions, and can be readily dismantled to form a compact unit for return shipment.

3,653,708
GRIPPING DEVICE
Anthony Merola, Pittsburgh, Pa., assignor to Amerota Products Corporation, Pittsburgh, Pa.
Filed May 16, 1969, Ser. No. 825,369
Int. Cl. B25b *3/00*
U.S. Cl. 294—102 R **8 Claims**



A gripping device is provided that has a pair of roller support members attached to a support means, the support members having confronting converging roller surfaces, with a resiliently secured roller on each surface in confronting relationship to the other roller. Motion of a member frictionally secured between the rollers in a direction away from the direction of convergence of the surfaces is easily achieved while any movement of the member in the direction of convergence of the surfaces causes a secure gripping of the member restraining it from such movement.

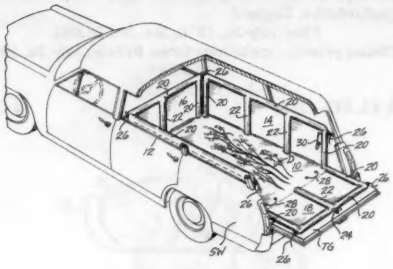
3,653,709
AIR DEFLECTOR
Darrell E. Gravett, 700 Penn, Carlisle, Iowa
Filed Nov. 19, 1969, Ser. No. 878,144
Int. Cl. B62d *35/00*
U.S. Cl. 296—1 S **4 Claims**



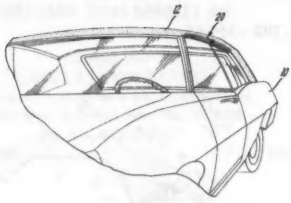
An air deflector for use with a vehicle having rear lights affixed to the rear end thereof is provided herein. The air deflector comprises an air scoop secured to the vehicle, a conduit leading from the air scoop to the rear of the vehicle and an arcuate shield secured to the outlet end of the conduit. A continuous passageway is provided through the air deflector and, when the vehicle is moving forwardly, the shield directs a continuous current of air across the exterior of the rear lights to prevent accumulation of foreign materials on the rear lights.

3,653,710
STORAGE COMPARTMENT LINER WITH INFLATABLE SUPPORT RIBS
Delbert J. Barnard, 4845 N.E. 42nd, Seattle, Wash.
Filed Apr. 29, 1970, Ser. No. 32,976
Int. Cl. B62d *33/04*
U.S. Cl. 296—39 R **10 Claims**

The liner is of sheet fabric construction. It includes a bottom that is approximately the same size as the compartment floor. A side wall is provided on at least the sides and forward end. At least some of the walls include inflatable ribs for giving the side walls standup rigidity.



3,653,711
DRIP MOLDING FOR A CONVERTIBLE TOP
James H. De Claire, Mt. Clemens; Floyd I. Dully, Detroit, and Neil A. Hull, Birmingham, all of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed May 4, 1970, Ser. No. 34,446
Int. Cl. B60j *7/00*
U.S. Cl. 296—107 **3 Claims**

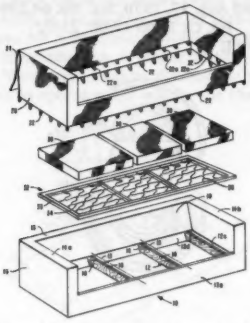


A side drip molding for attachment to the side rail of a frame that supports a convertible top on a vehicle body. The drip molding has a gutter portion and two retaining flange portions molded from a flexible material. The drip molding includes a clip portion formed as part of one of the two retaining flanges. The clip portion has a lip portion and rib portion to mount and hold the drip molding on the side rail.

3,653,712
FURNITURE UNIT
Maynard C. Sarvas, 4773 Dogwood, Seal Beach, Calif.
Filed May 18, 1970, Ser. No. 38,352
Int. Cl. A47c *31/10*
U.S. Cl. 297—218 **9 Claims**

Furniture units are disclosed including an integral frame having upper and lower portions, the upper portion defining cushioned sidearms and backrest, and the lower portion defining a rectangular box with upper and lower peripheral areas including anchor hooks disposed therealong. A unitary fabric covering covers the entire backrest and sidearms and is held in place under tension by resilient straps coupling the anchor hooks and marginal portions of the covering adjacent the hooks. A removable, resilient seat cushion platform is

supported by slats fixed within the rectangular box portion of the frame.



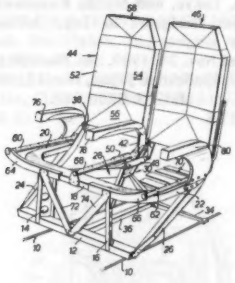
In one embodiment, the seat support structure has an extendible mattress frame.

3,653,713

SEATING STRUCTURE

Dennis Joseph Reason, and Leslie James Green, both of Ampthill, England, assignors to Hunting Engineering Limited

Filed July 23, 1970, Ser. No. 57,496
Int. Cl. B60n *1/00*
U.S. Cl. 297—232 **6 Claims**



A seating structure comprises a wrap around cross bar at seat level supported on pillars which are secured to a floor-level cross-beam fixed to rails on the floor of an aircraft. Side struts extend diagonally upwards connecting the sides of the cross bar with the rear ends of the wrap-around beam. A rear leg secured to the rails by a foot is connected to a rigid bifurcated lever at seat level, the lever being secured to the wrap-around beam. The spaces on either side of the leg such as might be caused by vertical rear side legs. In use, the upholstery is supported on webbing above the structure and back rests and arms are provided. The structure is designed to with stand loads in all three dimensions with minimum weight and minimum obstruction to the feet of passengers seated behind.

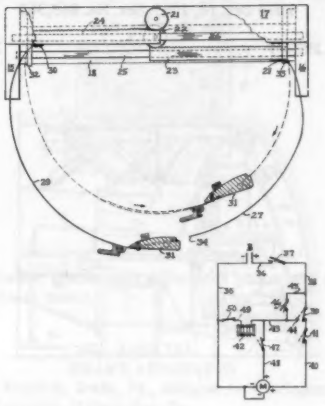
3,653,714

AUTOMATIC SAFETY SEAT BELTS

Michael Gentile, Route 4, Box 7, St. Charles, Ill.

Filed Feb. 24, 1970, Ser. No. 13,338
Int. Cl. A62b *35/60*
U.S. Cl. 297—385 **4 Claims**

Electrically controlled motor-driven safety seat belts that include complementary belt sections yieldably preshaped so that they may be retracted out of position when not in use, yet, when projected by their motor units energized through



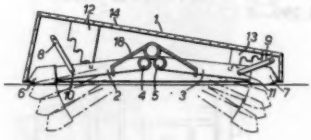
the ignition system of the vehicle, they will embrace the occupant of the vehicle seat and be automatically tightened thereabout.

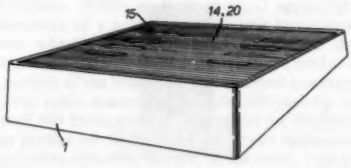
3,653,715

ADJUSTABLE FOOT RESTS

Fritz Drabert, and Klaus Geffers, both of Minden, Germany, assignors to Dravert Sohne, Minden/Westfalia, Germany

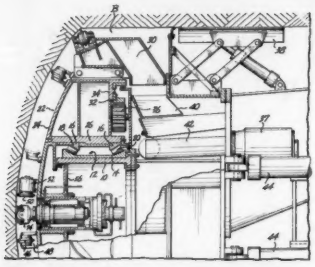
Filed Aug. 11, 1970, Ser. No. 62,903
Claims priority, application Germany, Oct. 4, 1969, P 19 50 162.3
U.S. Cl. 297—439 **3 Claims**





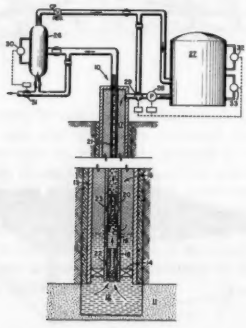
A foot rest includes a platform for receiving a person's feet and the platform has legs which are adjustable to vary the height and inclination of the platform. The legs can be fixed in any selected position by U-shaped pivotal members which engage in one of a selected number of grooves.

3,653,716
ROLLER BUTTER ROCK BORING APPARATUS AND METHOD
John S. Hattrup, Seattle, Wash., assignor to James S. Robbins and Associates, Inc., Seattle, Wash.
Filed Oct. 10, 1969, Ser. No. 865,362
Int. Cl. E01q *3/04*
U.S. Cl. 299—1 28 Claims



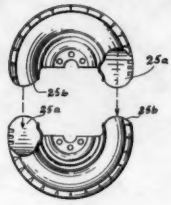
Kerf forming disc cutters are closely grouped on a cutter carrier. Where space permits a plural and equal number of cutter wheels are placed on each cutter path. A faster turning center cutter assembly is provided in the form of (1) a single abrasion type tri-cone cutter driven by either a stationary frame mounted on the carrier, or (2) an inner cutter carrier occupying the center region immediately radially inwardly of the location of the last cutter path involving plural cutter wheels, with a single kerf forming disc cutter wheel located on each circular cutter path of the inner cutter carrier.

3,653,717
ARTIFICIAL LIFT SYSTEM
Elvis Rich, and Edgar L. Von Rosenberg, both of Houston, Tex., assignors to Esso Production Research Company, Houston, Tex.
Filed Sept. 29, 1969, Ser. No. 861,958
Int. Cl. E21b *43/28*
U.S. Cl. 299—5 9 Claims



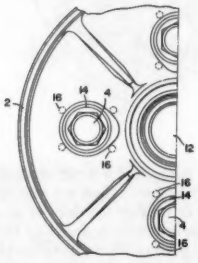
A method and system for artificially lifting enriched solvents in solution mining wells are disclosed. A liquid immiscible with and lighter in gravity than the solvent is injected in the well annulus while the solvent enriched with minerals is produced through the well tubing. The system can selectively be placed in continuous or intermittent operation.

3,653,718
MULTIPLE SECTION PNEUMATIC TIRE
Carl Gellender, 2885 West 12th, Brooklyn, N.Y.
Filed Aug. 17, 1970, Ser. No. 64,290
Int. Cl. B60b *19/00, 25/02*
U.S. Cl. 301—38 R 3 Claims



A tire and wheel combination made with a plurality of independent tire and wheel sections for individual mounting on and demounting from a vehicle. Each tire section has its own air chamber and each wheel section is independently mountable on the vehicle. Each tire section is joined to its wheel section. Adjoining sections butt smoothly to each other. Wheels may have a larger radius at the places where sections join and a smaller radius intermediate such places. Angles of intersection may be either perpendicular to the plane of the tire or, preferably, at opposed angles with respect thereto.

3,653,719
WHEEL CAP FIXING DEVICE
Shigeru Osawa, Tokyo, and Michio Kanazawa, Sagamihara, both of Japan, assignors to Topy Industries, Limited, Tokyo, Japan
Filed Nov. 26, 1969, Ser. No. 880,170
Claims priority, application Japan, Dec. 17, 1968, 43/92,030
Int. Cl. B60b *7/06*
U.S. Cl. 301—37 S 2 Claims

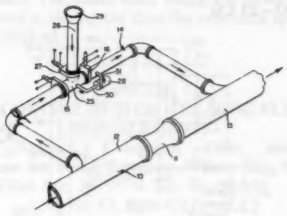


This device uses a cap nut provided at its flank with a flange which is urged through an elastic washer of a rubber substance and a wheel cap against a wheel disc when the cap nut is threadedly engaged with a stud bolt firmly secured to a vehicle hub.

3,653,720
HYDRAULIC TRANSPORTATION SYSTEM
Sam N. Craig, Devon, Pa., assignor to Wascon Systems, Inc., Hatboro, Pa.
Filed Mar. 4, 1970, Ser. No. 16,501
Int. Cl. B65g *53/30*
U.S. Cl. 302—15 17 Claims

A system is provided for hydraulic transportation of waste solids, whereby the solids may be introduced into a by-pass

line off a main duct, whereby the solids are introduced into a chamber after discontinuing the flow of water through the by-pass line, with the solids either being introduced into a chamber directly in the by-pass line, or into a chamber connected thereto for subsequent introduction into the by-pass line. In the latter situation, a pusher of the piston type may be utilized. Valves are used to discontinue the flow to the chamber, and to open a solids inlet to the chamber, with the



valves then being actuated to close the solids inlet and to open the chamber to the flow of water. In those instances wherein the chamber forms a part of the by-pass line, the water may then carry off the waste. In those instances wherein the chamber does not form a part of the by-pass line but communicates therewith, the pusher is then utilized to push the solids into the by-pass line. This procedure is then followed by the extraction of water from the chamber.

3,653,721

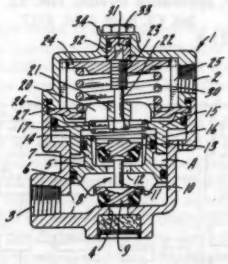
VARIABLE FRONT AXLE VALVE

Boleslaw Klimek, Des Plaines, Ill., assignor to Berg Mfg. & Sales Co., Des Plaines, Ill.

Filed July 27, 1970, Ser. No. 58,551

Int. Cl. B60t *15/36*; G05d *11/03*

U.S. Cl. 303—6 C **5 Claims**



A front axle valve automatically effective to vary the pressures supplied from a fluid pressure brake system to the front axle brakes and having means for varying the relationship of system to brake pressure.

3,653,722

FRONT BRAKE VALVE

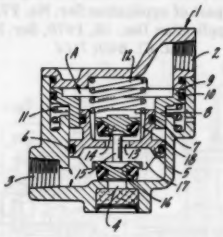
Boleslaw Klimek, Des Plaines, Ill., assignor to Berg Mfg. & Sales Co., Des Plaines, Ill.

Filed July 27, 1970, Ser. No. 58,552

Int. Cl. B60t *15/36*; G05d *11/03*

U.S. Cl. 303—6 C **4 Claims**

A valve assembly for varying brake pressures applied to front vehicle wheels including a differential piston, a second



piston effective against said differential piston and positive exhaust closing means.

3,653,723

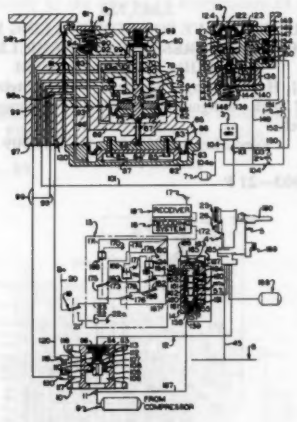
BRAKE APPARATUS

Robert J. Worbois, Irwin, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed May 21, 1970, Ser. No. 39,288

Int. Cl. B60t *15/18*

U.S. Cl. 303—20 **7 Claims**

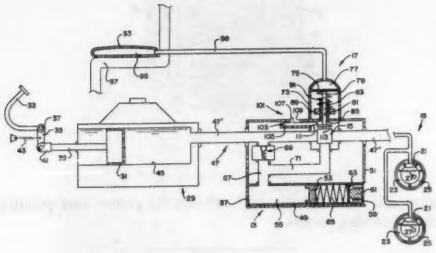


This invention relates to brake control apparatus for a slave locomotive of a remote multiple unit locomotive control system wherein a brake control console on the lead locomotive is manually operable to control the brakes on the forward portion of the train, and also to effect corresponding control (via radio-transmitted signals initiated by manual operation of this brake control console) of the brakes on the remaining portion of the train by the brake apparatus on a slave locomotive remotely located in the train. This control apparatus on the slave locomotive is operable, upon loss of radio control thereof from the lead locomotive, in response to a reduction of pressure in the train brake pipe effected by manual operation of the brake control console on the lead locomotive, to cause the brake pipe cut-off valve of the brake valve on the slave locomotive to operate to cut-off or terminate charging of the train pipe by the brake valve on the slave locomotive irrespective of the degree of train brake pipe leakage.

3,653,724
SAFETY BRAKE SYSTEM

William Van Smith, 1617 Duke Road, Memphis, Tenn.

Continuation-in-part of application Ser. No. 17,812, June 23, 1969. This application Dec. 18, 1970, Ser. No. 99,532
Int. Cl. B60t 7/14
U.S. Cl. 303—19 7 Claims

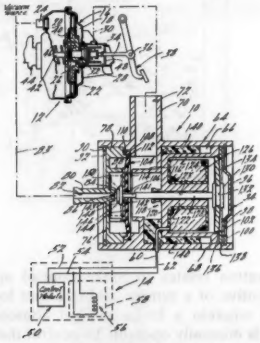


A safety brake system for a vehicle, which automatically applies the brakes when the driver of the vehicle leaves his seat. The system includes an accumulator for accumulating a quantity of fluid under pressure from the master cylinder assembly of the vehicle when the brake pedal of the vehicle is applied. A valve is actuated when the driver leaves his seat to cause the accumulated fluid to flow to the brakes and apply same.

3,653,725
AUXILIARY VALVE FOR CONTROLLING MASTER CYLINDER BRAKE PRESSURE IN A VEHICLE BRAKING AND SKID CONTROL SYSTEM

Edward J. Hayes, Ann Arbor, and William Stelzer, Milford, both of Mich., assignors to Kelsey-Hayes Company, Romulus, Mich.

Filed May 5, 1969, Ser. No. 821,909
Int. Cl. B60t 8/02
U.S. Cl. 303—21 F 1 Claim

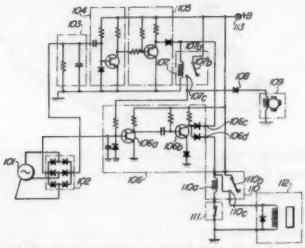


An auxiliary valve adapted for operative association with a vehicle braking system having a vacuum operated power brake unit and a skid control mechanism incorporated therein, the valve having an inlet and outlet sections, a valve member movable between positions permitting and preventing the flow of air from the inlet to the outlet section, and an actuating means including an electrically energized solenoid operable in response to a control signal from the skid control system to selectively bias the valve member toward one of the aforesaid positions so as to control the flow of air to the power brake unit and thereby limit the output pressure from the master cylinder of the break system during a skid control cycle.

3,653,726
ANTI-SKID DEVICE FOR VEHICLES

Hisato Wakamatsu; Noriyoshi Ando, and Kazu Majima, all of Kariya-shi, Japan, assignors to Nippon Denso Company Limited, Kariya-shi, Japan

Filed June 3, 1969, Ser. No. 829,901
Claims priority, application Japan, June 3, 1968, 43/37904; June 6, 1968, 43/38879; Oct. 31, 1968, 43/79445; Jan. 11, 1969, 44/2177
Int. Cl. B60t 8/12
U.S. Cl. 303—21 CG 2 Claims

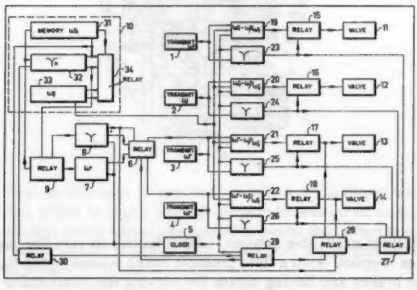


An anti-skid control device for a vehicle having wheel angular deceleration detecting apparatus for detecting the angular deceleration of the wheel, a switch element actuated by the output from the detecting apparatus so as to supply current to brake force releasing apparatus, and wheel rotation detecting apparatus, which, when the rotation of the wheel is stopped in the closed state of the switch element, is operative by detecting the stoppage of rotation of the wheel to maintain the supply of current to the brake force releasing apparatus until the rotation of the wheel is started again.

3,653,727
BRAKE CONTROL SYSTEM FOR WHEELED VEHICLES

Otto Gosta Kullberg, Smedsbacksgatan 11, Stockholm, and Olle Nordstrom, Enbacksvagen 13, Vallentuna, both of Sweden

Filed Sept. 22, 1969, Ser. No. 859,734
Claims priority, application Sweden, Oct. 22, 1968, 14286/68
Int. Cl. B60t 8/10, 8/12
U.S. Cl. 303—21 P 4 Claims



A brake control system for wheeled vehicles which includes transmitters located at each braked wheel of the vehicle, each of the transmitters generating an electrical signal corresponding to the rotary speed of the respective wheel. A reference speed generator is provided to produce a reference speed signal which is actuated by the output from at least one of the transmitters. Apparatus are provided to neutralize or reduce the braking power, temporarily supplied to the wheel, which provides an input for the reference speed generator,

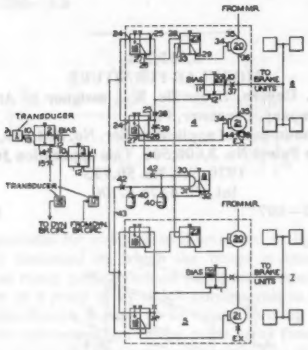
during the period it provides such an input. Associated with each of the wheels are calculating devices to determine the slip, defined as the quotient of the difference between the actual speed of the wheel and the reference speed divided by the reference speed. In addition, for each wheel apparatus are provided to determine the deceleration of that wheel. A control device compares the slip and deceleration for each of the wheels and, if necessary reduces the braking power supplied to that wheel. In the disclosed embodiment the reference speed is determined alternately from one of the two rear wheels. The wheel from which the reference speed signal is derived is, during the time the reference speed signal is derived, unbraked.

3,653,728

BRAKE CONTROL SYSTEM UTILIZING FLUIDIC LOGIC ELEMENTS

Ronald A. Sarbach, Columbus, Ohio, assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Apr. 28, 1970, Ser. No. 32,646
Int. Cl. B60t *8/22*
U.S. Cl. 303—22 R **8 Claims**



A pure fluid type brake control system for railway vehicles in which an input control signal representative of the desired brake effort is modified in accordance with the vehicle load for controlling the dynamic brakes. The difference between the load weighed brake control signal and a feedback signal corresponding to the variable effectiveness of the dynamic brake establishes an error signal for control of the friction brake which is regulated through a separate feedback loop to continuously blend with the dynamic brake and thereby satisfy the load weighed brake control signal. Provision is made to obtain full friction brake in response to a malfunction occurring in the digital application and release network comprising the friction brake control independently thereof.

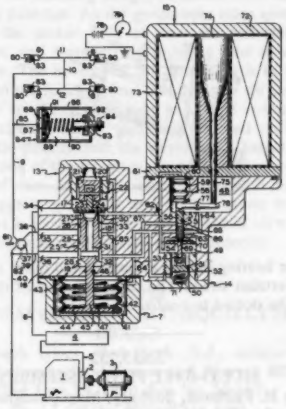
3,653,729

ELECTRICALLY CONTROLLED HYDRAULIC VALVE OF SELF-LAPPING TYPE

George K. Newell, Punta Gords, Fla., and Glenn T. McClure, McKeesport, Pa., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Dec. 19, 1969, Ser. No. 886,475
Int. Cl. B60t *15/02*
U.S. Cl. 303—50 **5 Claims**

An electrically controlled hydraulic valve device of the self-lapping type including a self-lapping supply valve for supplying hydraulic operating pressure to vehicle brake apparatus at a degree controlled by a pilot valve, which, in turn, is mechanically operated by a solenoid for causing the supply valve to supply at maximum operating pressure when the solenoid is completely deenergized, and to effect zero operating pressure and complete release thereof when the solenoid is fully energized, the degree of said operating pressure



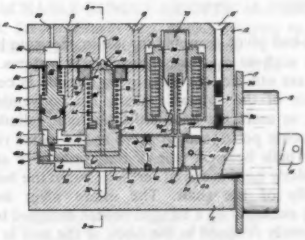
between said zero and maximum pressures being infinitely variable inversely to the degree of energization of the solenoid.

3,653,730

WHEEL LOCK FOR A VEHICLE

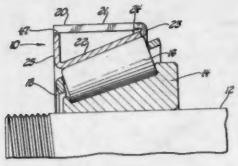
Dejan O. Cvetkovich, 212 S. Jensen Way, Fullerton, Calif.

Filed Jan. 27, 1970, Ser. No. 6,246
Int. Cl. B60t *17/16*
U.S. Cl. 303—89 **3 Claims**



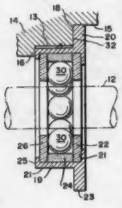
A wheel lock designed for vehicle theft prevention and comprising a valve interposed in the brake fluid line to at least one wheel brake of the vehicle. By closing the valve while the vehicle brake pedal is depressed, fluid under pressure is trapped between the valve and the brake, locking the wheels. Preferably, the valve comprises a camshaft operatively connected to a key operated rotary lock, a valve piston disposed within a housing and displaced by the camshaft, and a valve seat counterbored in a cover attached to the housing. A separate locking piston actuated by brake fluid under pressure and a solenoid respectively insure that the valve can be closed only when the brakes are applied and when the vehicle ignition system is off.

3,653,731
ROLLER BEARING
John C. Rau, 21880 Daisy Lane, Southfield, Mich.
Filed Aug. 14, 1970, Ser. No. 63,742
Int. Cl. F16c *19/04, 33/64*
U.S. Cl. 308—184 16 Claims



A roller bearing having a cantilevered outer race design to relieve Hertzian stress. The outer annulus of the outer race may also be slotted to control resilience.

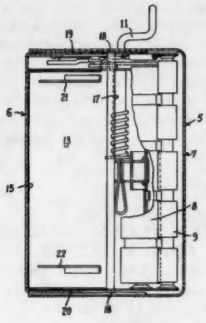
3,653,732
MULTI-BALL PIVOT ASSEMBLY
Winthrop H. Fairbank, Sudbury, Mass., assignor to Northop Corporation, Palos Verdes, Calif.
Filed Aug. 21, 1969, Ser. No. 851,958
Int. Cl. F16c *33/00, 19/04*
U.S. Cl. 308—193 2 Claims



A multi-ball pivot assembly for use in precision bearing applications such as gyroscope suspension systems. No inner raceways are utilized, the balls being directly in contact with the surface of the rotatable shaft. No conventional outer raceways, as such, are used either, a right cylinder of hard material being positioned to serve as the outer ring against which the balls bear. A pair of flat washers of sapphire or other similarly hard material serve to retain the balls in position axially of the shaft. The entire pivot assembly is preferably enclosed by a flanged holder designed to be firmly and accurately retained in the body of the unit in which the shaft turns.

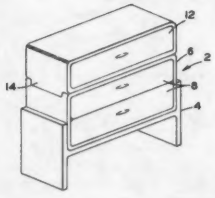
3,653,733
ROLL SUPPORT BRACKET FOR WEB DISPENSERS
Gerald W. Wyant, 4343 Mayfair Ave., Montreal, Quebec, Canada
Filed Oct. 13, 1970, Ser. No. 80,356
Int. Cl. B65h *19/00*
U.S. Cl. 312—39 7 Claims

A web dispenser for feeding a web of material from a roll within a cabinet, the web being fed through the nip between a driving roll and a pressure applying roll, and a support plate for the roll of material mounted within the cabinet adjacent to and tangent to the top portion of the web driving roll, the support plate being projected at an angle downwardly and rearwardly of the web driving roll and brackets on the support plate to position the roll of material in axial parallel



alignment with the nip between the driving and pressure applying rolls.

3,653,734
MODULAR FURNITURE
Nicholas A. Ungaro, Louisville, Ky., assignor to Armstrong Cork Company, Lancaster, Pa.
Continuation-in-part of application Ser. No. 804,499, Mar. 5, 1969, now Patent No. 3,606,506. This application June 29, 1970, Ser. No. 50,793
Int. Cl. A47b *87/00*
U.S. Cl. 312—107 6 Claims

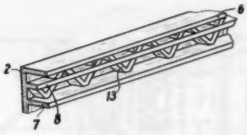


Modular furniture is assembled in a number of different designs from certain standard components. An H-shaped support frame is adapted to hold canister elements into which there are placed drawers or onto which is positioned doors. A lip structure on the canister locks the canister to the support frame. It is possible to lock together a plurality of canister structures without the support frame and with just the lip structure being used to hold together the plurality of canisters. The H-shaped frame could be utilized alone and, when provided with a number of legs of different lengths, the support frame may be utilized to form a plurality of book shelves of different heights.

3,653,735
MOLDED DRAWER GUIDES
Hans-Werner Duepree, Avenwedde, Germany, assignor to Elco Kunststoffe A. Elges & Co., Avenwedde, Germany
Filed Sept. 26, 1969, Ser. No. 861,414
Claims priority, application Germany, Oct. 3, 1968, G 68 00 639
Int. Cl. A47b *88/00*
U.S. Cl. 312—330 4 Claims

Furniture drawers produced by injection molding are pro-

vided with various edge guides and combinations thereof for



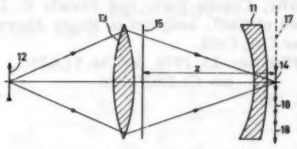
greater rigidity and smoother operation.

3,653,736

HOLOGRAPHIC MULTIPLE IMAGE FORMATION WITH ASTIGMATISM CORRECTION

Christiaan Hendrix Frans Velzel, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 24, 1970, Ser. No. 49,280
Claims priority, application Netherlands, June 25, 1969, 6909695
Int. Cl. G02b *27/00*
U.S. Cl. 350—3.5 **3 Claims**



An apparatus for imaging an illuminated or light-emitting object is discussed by which the image is simultaneously formed at many predetermined locations in space, whilst a hologram of a point array which corresponds to the desired spatial distribution is used as an image forming means and during the reconstruction of the point array from the hologram the usual reference source is replaced by the article or a corresponding image.

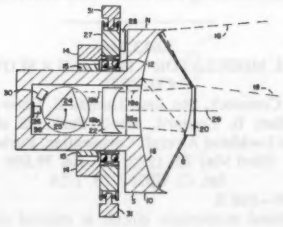
It is stated that at least one correcting lens is provided between the image plane and the hologram both during the recording of the hologram and during the reconstruction of the point array.

3,653,737

OPTICAL SCANNING SEEKER

William W. Stripling, and Lester M. Ross, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army

Filed Aug. 24, 1970, Ser. No. 66,203
Int. Cl. G02b *17/00*
U.S. Cl. 350—7 **2 Claims**



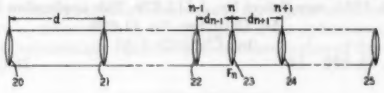
In an optical scanning target seeker, optical elements carried within a spinning gyroscopic mass scan the seeker field of view. The seeker spin axis is defined by the gyroscopic mass spin axis. The optical elements are positioned along the gyroscopic mass spin axis, or seeker spin axis, and include a parabolic reflector cut in a face of the gyroscopic mass, a slanted mirror mounted facing the parabolic reflector, and a focusing lens for focusing images reflected from the slanted mirror onto a detector. As the gyroscopic mass spins, energy beams from the seeker field of view are reflected off the slanted mirror and through the focusing lens in a circular sweep pattern. The novelty of this invention is in rotating a prism between the focusing lens and detector on an axis that is orthogonal to the seeker spin axis. The rotating prism changes the circular sweep pattern to curved radial beams and sweeps the beams over the detector. A target image is displayed on one of the beams when a target is present in the seeker field of view. Magnetic sensors react with magnets on the rotating gyroscopic mass and on the prism to indicate where a target is located in the seeker field of view when an image from the target is displayed on the detector.

3,653,738

OPTICAL WAVEGUIDE WITH UNEQUALLY SPACED LENSES

Detlef Christoph Gloge, Red Bank, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 29, 1970, Ser. No. 50,569
Int. Cl. G02b *27/00;* **H01p** *3/00*
U.S. Cl. 350—96 WG **5 Claims**



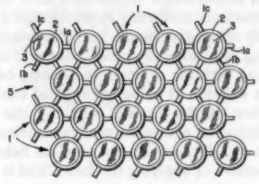
A beam waveguide for guiding optical wave energy over extended distances by means of lenses of variable spacing whose focal lengths are a function of the separation from adjacent lenses and the maximum lens-to-lens spacing in the system.

3,653,739

LEACHABLE BUNDLE OF OPTICAL FIBERS

Richard R. Strack, Sturbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed July 2, 1970, Ser. No. 51,784
Int. Cl. G02b *5/14*
U.S. Cl. 350—96 B **4 Claims**



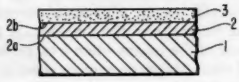
A plurality of optical fibers each having a core of high refractive index light-transmitting material, a cladding of lower refractive index material and a number of longitudinal acid-soluble rods fused to the exterior of the cladding are formed into a bundle with the rods spacing the fibers apart and leaving voids between them. The bundle is elongated by drawing and the drawn bundle having voids between its fibers is potted at each end with an acid resistant material whereupon it is leached to remove lengths of the rods between the end coatings for producing a flexible image-transmitting conduit.

3,653,740

PROJECTION SCREEN

Shuichi Ogura, and Katsuhisa Ueda, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 14, 1969, Ser. No. 850,090
Claims priority, application Japan, Aug. 14, 1968, 43/57754
Int. Cl. G03b 21/56
U.S. Cl. 350—117 **10 Claims**



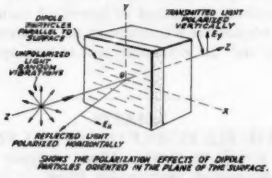
There is provided a projection screen comprising a support, a layer of double rolled aluminum foil having one smooth surface and one coarse surface, the smooth surface thereof being in contact with the support, and a brushed resin film on the coarse surface of said aluminum foil.

3,653,741

ELECTRO-OPTICAL DIPOLAR MATERIAL

Alvin M. Marks, 166-25 Ninth Avenue, Whitestone, N.Y.

Continuation-in-part of application Ser. No. 378,836, June 29, 1964, now Patent No. 3,512,876. This application Feb. 16, 1970, Ser. No. 11,696
Int. Cl. G02b 5/30
U.S. Cl. 350—147 **26 Claims**


DIPOLE PARTICLES PARALLEL TO SURFACE
UNPOLARIZED LIGHT RANDOM VIBRATIONS
TRANSMITTED LIGHT POLARIZED VERTICALLY
REFLECTED LIGHT POLARIZED HORIZONTALLY
SHOWS THE POLARIZATION EFFECTS OF DIPOLE PARTICLES ORIENTED IN THE PLANE OF THE SURFACE.

An article of manufacture is provided as a matrix having dispersed substantially uniformly therethrough a plurality of electro-optically responsive dipole particles selected from the group consisting of electrically conductive and semi-conductive material and dichroic crystals, the matrix being a transparent medium capable of being in the fluid state during the initial orientation of the dipoles, whereby the dipoles are capable of rotation to a desired preferred orientation upon the application of a force field, the medium being thereafter solidified. A method of applying the force field is disclosed.

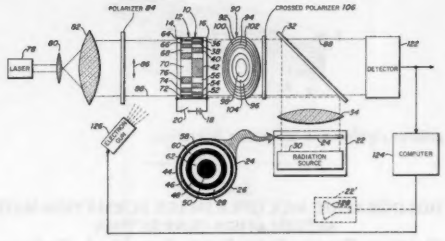
3,653,742

ELECTRO-OPTIC VARIABLE FRESNEL ZONE PLATE

William R. Buchan, Lincoln, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed June 24, 1970, Ser. No. 53,768
Int. Cl. G02f 1/20
U.S. Cl. 350—150 **10 Claims**

Apparatus is disclosed including a variable electro-optic Fresnel zone plate having an electro-optic medium with a characteristic that varies as a function of an applied electric field, means for applying to that medium an electric field whose intensity varies in a pattern of alternate high intensity and low intensity bands, and means for demodulating radiation modulated by that characteristic of the medium to produce a Fresnel zone plate pattern of radiation.

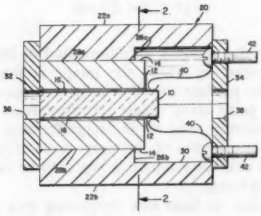


3,653,743

ELECTRO-OPTIC DEVICES WITH ACOUSTO-OPTIC EFFECT SUPPRESSION

James E. Kiefer, Canoga Park, and Francis E. Goodwin, Malibu, both of Calif., assignors to Hughs Aircraft Company, Culver City, Calif.

Filed Nov. 23, 1970, Ser. No. 91,625
Int. Cl. G02f 1/26
U.S. Cl. 350—150 **7 Claims**



Acousto-optic resonances in a crystal of a material exhibiting the linear electro-optic effect may be suppressed by coupling to the respective lateral faces of the crystal a plurality of slabs of a material having high acoustic energy absorption properties and an acoustic impedance substantially matching the acoustic impedance of the crystal. Lead, lead glass or titanium are exemplary appropriate acoustic energy absorbing materials for gallium arsenide or cadmium telluride crystals. A layer of either a non-bonding acoustic energy coupling material (such as silicone grease or indium), or a coupling and bonding material (such as shellac) is disposed between each absorbing slab and the adjacent crystal face.

3,653,744

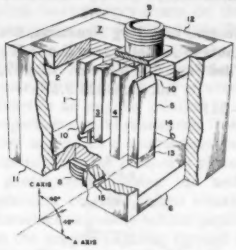
OPTICAL MODULATOR UTILIZING A SLOW WAVE CIRCUIT

Richard L. Comstock, San Jose; Kungta K. Chow, Sunnyvale, and William B. Leonard, Menlo Park, all of Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Filed May 22, 1970, Ser. No. 39,806
Int. Cl. G02f 1/18, 1/26
U.S. Cl. 350—160 R **4 Claims**

A broadband microwave circuit is utilized to provide a microwave electric field to interact with an electro-optic crystal to attain wideband light modulation. The electro-optic crystal in the modulator device is positioned in the path of a

laser beam. The microwave electric field changes the ellipticity of polarization of the laser beam passing through the



electro-optic crystal. A polarization analyzer is used to convert the polarization modulation to intensity modulation.

3,653,745

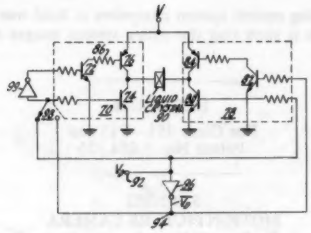
CIRCUITS FOR DRIVING LOADS SUCH AS LIQUID CRYSTAL DISPLAYS

Roger Alain Mao, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed June 11, 1970, Ser. No. 45,508

Int. Cl. G02f *1/28*

U.S. Cl. 350—160 R **15 Claims**



A pair of amplifiers and a load such as a liquid crystal connected between the output electrodes of the amplifiers. In response to one relationship between the input signals to the amplifiers, an alternating turn-on voltage is applied via at least one of the amplifiers to the liquid crystal for causing it to scatter light. In response to another relationship between said input signals, the light scattering produced by the liquid crystal is reduced to a relatively low value.

3,653,746

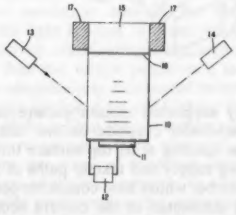
ACOUSTO-OPTIC DEVICE

Arthur Woodward Warner, Jr., Whippany, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Oct. 19, 1970, Ser. No. 81,839

Int. Cl. G02f *1/34*

U.S. Cl. 350—161 **2 Claims**



The specification describes an acousto-optic device comprising an acoustic medium of lead molybdate and an acoustic-energy absorbing element of beryllium oxide. This combination of materials is optimized for several parameters including thermal expansion, thermal conductivity, mechanical impedance, and acoustic absorption.

3,653,747

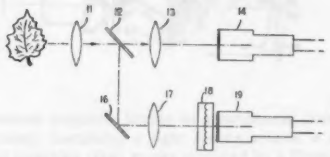
FOCUSING DEVICE FOR COLOR TELEVISION CAMERAS

Herwig Werner Kogelnik, Fair Haven, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Nov. 10, 1970, Ser. No. 88,277

Int. Cl. G02b *27/16*

U.S. Cl. 350—171 **4 Claims**



A two camera Kell type color system has a lenticular array of cylindrical lenslets of material of refractive index n_2 overlaid by a material of refractive index n_1, adjacent one camera where n_2 differs from n_1 in one region of the optical spectrum and is substantially equal to n_1 in another region of the spectrum.

3,653,748

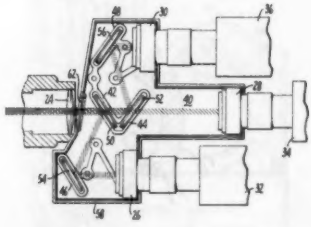
COLOR DIVIDER FOR COLOR VIDEO CAMERAS

Skipwith W. Athey, Portola Valley, Calif., assignor to International Video Corporation, Mountainview, Calif.

Filed Dec. 26, 1968, Ser. No. 787,042

Int. Cl. G02b *27/14*, *5/28*

U.S. Cl. 350—171 **4 Claims**



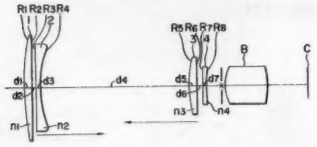
A color divider for color video cameras in which color separation is obtained by interposing two dichroic mirrors in the optical path of the camera for reflecting two of the three primary colors out of the optical path. Two more mirrors reflect the initially reflected light along paths parallel to the optical path so that the three primary colors are directed along three parallel paths to three video detectors. The two additional mirrors are also dichroic mirrors which function to eliminate light of certain wave lengths from the light transmitted to two of the detectors so that ideal taking characteristics are obtained for the NTSC type color system without gelatin filters.

3,653,749

VARIABLE-MAGNIFICATION AFOCAL OPTICAL LENS SYSTEM

Motoaki Kawazu, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Aug. 3, 1970, Ser. No. 60,699
Claims priority, application Japan, Aug. 2, 1969, 44/61217
Int. Cl. G02b *15/14*
U.S. Cl. 350—184 2 Claims



A variable-magnification afocal optical lens system which may be used in combination with a photographic lens of a motion-picture camera using 8 mm film or a projection lens of a projector so that the compound focal length may be continuously varied with a zoom ratio of 2:1 and comprising two planoconvex lenses and two planoconcave lenses whose cost is comparatively low and arranged such that the image errors do not vary unacceptably in the shifting.

3,653,750

ROTATIONALLY SYMMETRIC OPTICAL COMPONENT COMPOSED OF AT LEAST TWO LENSES

Helmut Marx, Wetzlar, and Hermann Desch, Niederquembach, both of Germany, assignors to Ernst Lutz GmbH, Wetzlar, Germany

Filed Apr. 28, 1970, Ser. No. 32,588
Claims priority, application Germany, May 2, 1969, P 19 22 354.2
Int. Cl. G02b *3/04, 3/00, 11/00*
U.S. Cl. 350—189 7 Claims

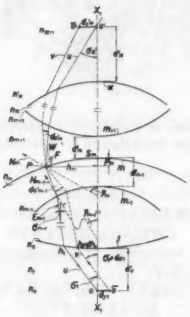
A rotationally symmetric component and method of producing it, for optical imaging systems having a quasi-aspherical concave surface obtained as a result of cementing to a base lens a second lens, then grinding the combined lenses so that only an annular rim lens is left of the second lens, and optionally cementing thereto a third lens, and/or a fourth lens, while each time grinding and polishing the composite body to reduce the additional lenses to rim lenses, the radii and optical characteristics being of such a magnitude that the combined refractive characteristics resemble those of an aspherical surface.

3,653,751

OPTICAL SYSTEM HAVING FRESNEL SURFACES FOR IMAGING NEAR-AXIS POINTS WITHOUT MERIDIONAL COMA

Christian Hofmann, and Jorg Neumann, both of Jena, Germany, assignors to Jenoptik Jena G.m.b.H., Jena, Germany

Filed Sept. 5, 1969, Ser. No. 869,987
Int. Cl. G02b *3/08*
U.S. Cl. 350—211 11 Claims



An imaging optical system comprises at least one Fresnel face, which is such that the entire system images aplanatically.

ERRATUM

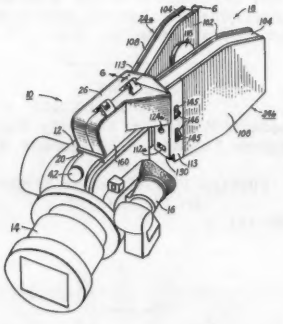
For Class 351—113 see:
Patent No. 3,654,376

3,653,752

MOTION PICTURE CAMERA

Anton Wilson, Yonkers, N.Y., assignor to Anton Bauer, Norwalk, Conn.

Filed Sept. 30, 1970, Ser. No. 76,960
Int. Cl. G03b *23/02*
U.S. Cl. 352—72 33 Claims



A manually supported motion picture camera having a housing, a viewfinder eyepiece on one side of the housing and an access opening at its top surface through which film may pass along supply and takeup paths of travel has a hollow throat member whose base connector portion is seated in and operably connected to the camera access opening; the throat member includes a rear wall having angularly related wall portions which are located beyond the rear of the

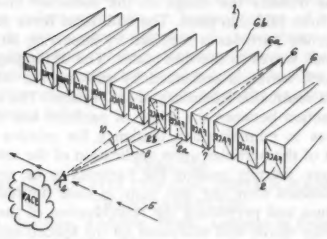
camera, one of the wall portions extends generally perpendicularly to the longitudinal axis of the throat and the other wall portion is positioned at an acute angle to the first wall portion and extends toward the camera on the side of the eyepiece; a first magazine adapted to contain film to be supplied to and exposed in the camera is secured to one of the rear wall portions and a second magazine, adapted to takeup film from the camera as it is exposed, is secured to the other of the wall portions in an angular relation to the first film magazine; the magazines extend rearwardly from the camera and throat member to provide a counterbalance force to the weight of the camera when the camera is placed against the shoulder of a photographer during use and the throat member has a plurality of guide rollers rotatably mounted therein at predetermined angularly related positions for guiding the film from the supply magazine through the throat to the camera and for guiding the exposed film from the camera as it is returned through the throat to the takeup magazine.

3,653,753

OPTICAL SHUTTER SYSTEM AND METHODS RELATED THERETO

Robert W. Mitchell, St. Joseph, Mich., assignor to Seneca Plastic Limited, Toronto, Canada

Filed July 22, 1970, Ser. No. 57,086
Int. Cl. G03b *17/02*
U.S. Cl. 352—100 **25 Claims**



An optical shutter system and methods of establishing the relative positions of the elements of the system are disclosed for use in simulated animated displays, in enabling viewing an image where the viewer and image are moving relative to one another at a rapid rate, and in related applications. A series of images which may be progressively varied and carried on transparencies are associated with the optical shutter system. The shutter system includes a linear light source and a pellucid sheet and may include one or more reflective surfaces selectively oriented with respect to the transparencies on the side of the transparency opposite the viewer. When there is effective relative movement between the viewer and the transparencies, the light appears to sweep across each transparency, progressively illuminating linear adjacent segments of each image; thus the viewer perceives a motion picture composed of the progressively illuminated image segments.

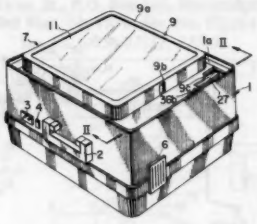
Methods are also disclosed for establishing the orientation of the elements of the optical shutter system relative to each other and to the transparency to be observed. The methods take into account the range of expected viewing distances and the dimensions of the transparency, as well as the space available in varying environments for mounting the system, the light intensity desired and the repetition rate required for optimum viewing.

3,653,754

OVERHEAD PROJECTOR

Einemi Yamanaka, Kawaguchi-shi, Japan, assignor to Cabin Kogyo Kabushiki Kaisha, Japan

Filed Dec. 29, 1969, Ser. No. 888,313
Int. Cl. G03b *21/16*
U.S. Cl. 353—61 **5 Claims**



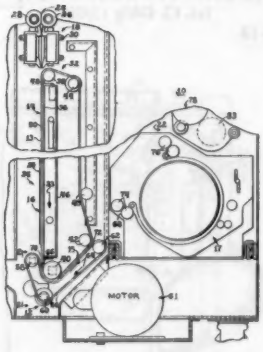
An overhead projector having an arrangement comprising a body casing containing a light source means, a cooling means and openable stage means mounted by a Fresnel lens, and collapsible supporting means for supporting a projection head, both of said collapsible supporting means and said projection head being adapted to be accommodated within the space in said body casing, and means capable of cutting off the power source circuit as said stage means is opened.

3,653,755

COPY SHEET TRANSPORT APPARATUS

Arthur S. Serfahs, Elk Grove, and Robert C. Patzke, Prospect Heights, both of Ill., assignors to Addressograph-Multigraph Corporation, Mount Prospect, Ill.

Filed Mar. 12, 1970, Ser. No. 18,869
Int. Cl. G03g *15/00*
U.S. Cl. 355—3 **15 Claims**



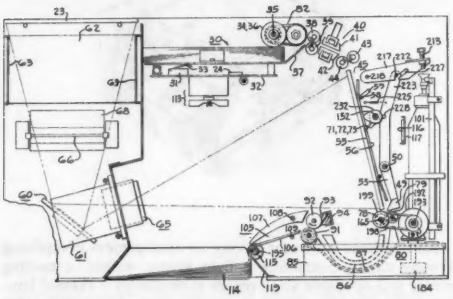
Apparatus for transporting electrostatically charged and/or imaged copy sheet material in an electrostatic copier is disclosed. The apparatus includes an endless transport member having an exterior surface fabricated of a non-conductive, piled, moisture resistant material, preferably of nylon, orlon, or dacron. A copy sheet is transported with the charged and/or imaged surface thereof in contacting relation with the exterior surface of the transport member to minimize the dissipation of the charge from the copy sheet surface while in transit.

3,653,756

MECHANICALLY ACTUATED PHOTOCOPY MACHINE

Eugene F. Mielnikowski, Jr., Morristown; Frank L. Kratcoski, Dover, and Gerardo M. La Morte, Newark, all of N.J., assignors to Dynagraphic Systems, Inc., Cedar Knolls, N.J.

Filed July 15, 1968, Ser. No. 745,019
Int. Cl. G03g 15/00
U.S. Cl. 355—3 14 Claims



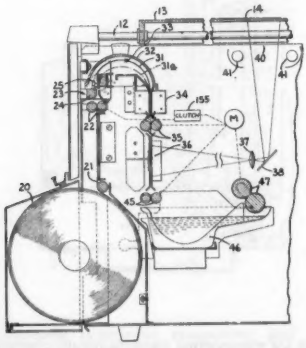
A photocopy machine having a plurality of stations performing a sequence of operations in a single copying cycle, the sequence of the operations being controlled by a series of cam mechanisms, all of which are actuated by a single drive means. A multiple station indexing means is provided for engaging the drive means from one to a finite number of times upon completion of each copy cycle.

3,653,757

WEB FED PHOTOCOPY MACHINE HAVING IMPROVED LENGTH SETTING AND CUTTING MEANS

Harley M. Newcomb, Bensenville, Ill., assignor to APECO Corporation

Filed Feb. 5, 1970, Ser. No. 8,983
Int. Cl. G03g 15/00
U.S. Cl. 355—13 13 Claims



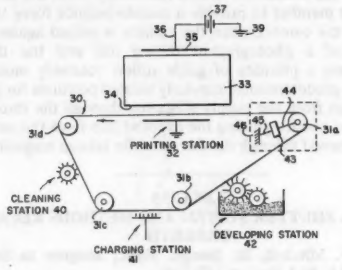
A photocopy machine in which a web of photocopy paper is fed from a supply roll and in which a length setting mechanism, manually settable to the length of the original document on a moving table, upon movement of the table, operates an oscillatory cutting mechanism to produce a copy sheet of the same length as the original document without affecting the speed of movement of the copy sheet through the machine.

3,653,758

PRESSURELESS NON-CONTACT ELECTROSTATIC PRINTING

Donald S. Trimmer, and Walter B. Bienert, both of Baltimore, Md., assignors to Frye Industries, Inc., New York, N.Y.

Filed July 10, 1970, Ser. No. 53,938
Int. Cl. G03g 15/00; B05b 5/00; B05c 11/00
U.S. Cl. 355—16 21 Claims



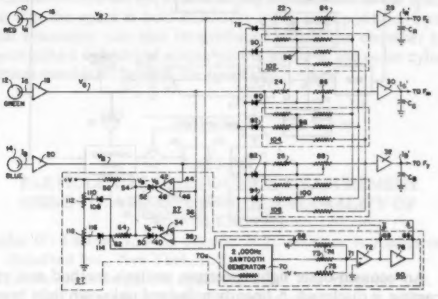
A pre-determined, non-random electrostatic image is formed and developed on a thin, flexible plate about 0.0005 to about 0.050 inch thick. A substrate to be printed is positioned facing but spaced apart from this pre-formed image of particles, and an electrostatic field is established therebetween. The field is of insufficient strength to dislodge the image of particles from the thin plate, but of sufficient strength to transfer the image to the substrate once it is dislodged from said thin plate. The additional force required to dislodge the particles is supplied by imparting ultrasonic flexual shock waves to the thin plates. The dislodging effect of the shock waves is enhanced by exciting the vibratory system at a resonance frequency of said system. The electrostatic attraction between the image of particles and the thin plate serves to minimize any tendency for relative lateral movement of the particles upon application of the ultrasonic shock waves, thereby causing the particles to be propelled directly outward from the thin plate in their desired image configuration and permitting the reproduction of the image with superior clarity and sharpness on the spaced-apart substrate. By sweeping the driving frequency through a range including a resonance frequency of the vibratory system, several distinct resonances of the thin plate will be effected, thereby superimposing several nodal patterns on said thin plate so as to minimize variations in the particle intensity of the reproduced image and further enhancing the quality of said image. For continuous operations, the thin plate is conveniently employed in the form of a rotatably mounted continuous belt, with a cleaning station, a charging station, a development station, and an image transfer station positioned along the path of rotation. A metallic belt may be employed with a non-conductive image formed thereon by coating the plate with a light sensitive photo-resist material, exposing the coating to light through a negative of the desired image and developing the thus exposed image by dissolving the unexposed, non-image areas with an organic solvent. The flexual waves may be generated in the thin plate by a piezoelectric crystal system. When the thin plate is used in the form of a continuous belt, the piezoelectric crystal system may conveniently be affixed or otherwise connected to one of the belt-supporting rollers. The piezoelectric crystals may also be incorporated as an integral part of such a roller for greater convenience and control in continuous printing operations. Excitation of the crystal system can occur nearly instantaneously when the printing gap is less than about one-eighth inch. At about three-sixteenth inch or more, the amplitude of the excitation signal may be increased slowly, and the driving frequency may be swept slowly to limit the instantaneous toner current in the gap and avoid mutual repulsion of particles and some distortion of the reproduced image.

3,653,759

AUTOMATIC CONTROL OF COLOR CORRECTION OF PHOTOGRAPHIC PRINTERS

William C. Klein, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 8, 1970, Ser. No. 96,039
Int. Cl. G03b 27/78
U.S. Cl. 355—38 14 Claims



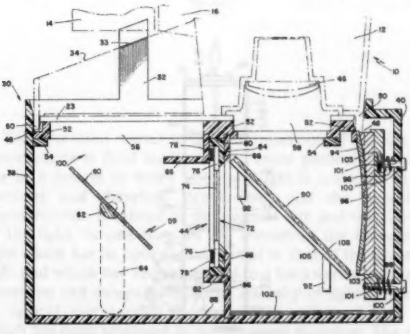
Apparatus for controlling and continuously varying the color correction level of the printing beam of a color printer from a low color correction level to a high color correction level in proportion to the detected red, green and blue LATD's of the negative. A color balanced negative is printed with low color correction. A higher degree of color correction is automatically applied in accordance with the degree of imbalance of the color composition of the negative; and a high color correction level is applied to alter the color composition of the printing beam when the negative exhibits an illuminant failure.

3,653,760

APPARATUS FOR COPYING PHOTOGRAPHIC TRANSPARENCIES

Bruce K. Johnson, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 18, 1970, Ser. No. 99,348
Int. Cl. G03b 27/62
U.S. Cl. 355—39 19 Claims



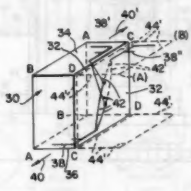
Photographic apparatus for copying the image of a scene recorded upon a photographic transparency used in conjunction with a camera of the self-developing variety having a mounted source of artificial illumination. The apparatus directs light from the source along a folded optical path and into the camera lens. A concave mirror is positioned within the path optically coaxial with the camera lens and the transparency and serves to magnify the image thereof without aberration.

3,653,761

OPTICAL SYSTEM

John Wilbur Hicks, Jr., P.O. Box 246, Sturbridge, Mass.

Filed Mar. 10, 1970, Ser. No. 18,264
Int. Cl. G03b 27/32, 32/00
U.S. Cl. 355—51 11 Claims



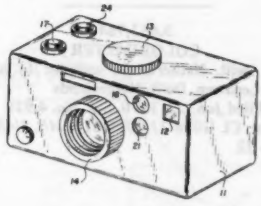
An optical system for use in a copy machine or the like is described as including an optical element for use with an image receiving medium and an image original medium such that an image from the image original medium is propagated through the element, lens inverted by the element, and mirror reversed by the element to impinge upon the image receiving medium.

3,653,762

AUTOMATIC RANGEFINDER

Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 28, 1970, Ser. No. 76,081
Int. Cl. G01c 3/08
U.S. Cl. 356—4 12 Claims



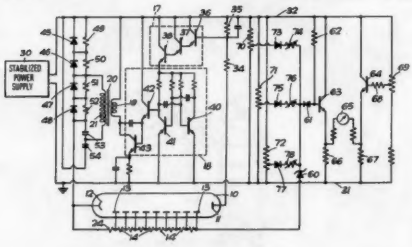
Apparatus is disclosed for positioning an objective lens to focus an image of an object in a film plane which includes means for projecting a contrast pattern on the object, and a second lens for receiving and transmitting light reflected from the object to form an image of the contrast pattern upon a photocell. The photocell has a particular discernable output when the image is focused on the photocell. The apparatus also includes a mechanism for varying the distance between the second lens and the photocell to focus the image formed by the second lens upon the photocell and means responsive to the particular discernable output to position the objective lens so that the image of the object formed by the objective lens is focused in the film plane.

3,653,763

APPARATUS FOR THE MEASUREMENT OF ULTRA-VIOLET, VISIBLE AND/OR INFRA-RED RADIATION

Arthur Gordon Davies, London, England, assignor to Medical and Electrical Instrumentation Company, London, England

Filed May 4, 1970, Ser. No. 34,344
Claims priority, application Great Britain, May 5, 1969, 22,882/69
Int. Cl. G01n *21/34*; G01j *3/00*; G01n *21/06*
U.S. Cl. 356—51 11 Claims



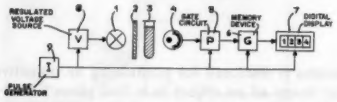
A radiation measuring device for ultra-violet, visible or infra-red radiation, particularly suitable for use in a color analyser for photographic printing has a photomultiplier tube with a current sensing resistor in the anode circuit. The voltage across this resistor is used to control the amplitude of oscillation of an oscillator which, via a step-up transformer and rectifier circuit, provides E.H.T. for the tube. The E.H.T. voltage is thus controlled to maintain the anode current sensibly constant. The controlled E.H.T. voltage also is applied to the bleeder resistor chain for the dynodes of the photomultiplier tube, which resistor chain, with a series measuring resistor, forms a potential divider; the voltage across the measuring resistor is proportional to the logarithm of the light intensity and a temperature compensated correction circuit is provided to improve the linearity of this relationship. The voltage across the measuring resistor is applied to one input of a differential voltage measuring circuit having, in the case of a color analyzer, a second input from potential sources switched in synchronism with the color filter selection.

3,653,764

COLORIMETER

Imre Schodl, Delft, Netherlands, assignor to Arie Hendrik Gerrit Van Leeuwen, Delft, Netherlands

Filed Jan. 22, 1970, Ser. No. 4,929
Int. Cl. G01n *21/00*; G01j *3/46*, *3/48*
U.S. Cl. 356—72 3 Claims



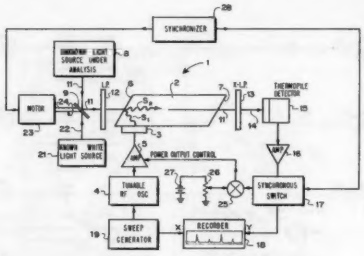
This invention relates to a colorimeter with a light source which through a sample to be investigated illuminates a photo-electric transducer, the output of which is connected to a measuring device for measuring the intensity of the transmitted light. The light source is operated from a supply source which is effective to intermittently energize and de-energize the light source, the de-energized periods of the light source being at least as long as the energized periods.

3,653,765

ACOUSTO-OPTIC LIGHT SPECTRUM ANALYSIS

John R. Hearn, Los Altos Hills, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed June 17, 1970, Ser. No. 47,044
Int. Cl. G01j *3/28*, *3/32*
U.S. Cl. 356—81 2 Claims



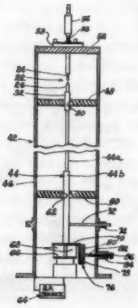
An acousto-optic light spectrum analysis method and apparatus is disclosed. A linearly polarized unknown light beam to be spectrum analyzed is collinearly diffracted on an acoustic wave in an optically anisotropic medium to diffract light of the first linear polarization and of a frequency related to the frequency of the acoustic wave into light of a second polarization. The diffracted unknown light beam is polarization analyzed to separate the light of the second polarization from the light of the first polarization. The frequency of the acoustic wave is swept and the light of the second polarization is detected as a function of the sweep to obtain a spectrum analysis of the unknown light beam. The output spectrum of the unknown light beam is calibrated by switching a known light source through the acousto-optic system for calibration of the output spectrum.

3,653,766

CURRENT-INJECTION SPARK SOURCE FOR EMISSION SPECTROSCOPY

John P. Walters, Madison, Wis., and Thomas V. Bruhns, Lacey, Wash., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Feb. 4, 1970, Ser. No. 8,462
Int. Cl. G01j *3/30*
U.S. Cl. 356—86 24 Claims



An analytical spark gap is provided between the conductors of a resonant line at one end thereof. The other end of the line is connected to a radio frequency power source which can be electronically pulsed. The conductors of the

line are preferably in the form of inner and outer coaxial cylinders. The spark gap is preferably between a first electrode at one end of the inner conductor and a second axial electrode connected by means of an end wall to the outer electrode. A current injection input lead is connected to an intermediate point along the line, so as to provide an effective length of one-quarter wavelength between the injection point and the spark gap. In this way, a node is produced at the injection point. Around the spark gap, the outer conductor forms a cylindrical chamber, in which acoustical resonances are set up, with resulting stabilization of the spark in that the spark is held stationary in an axial position. Optical resonance can also be produced within the chamber by providing a cylindrical mirror on the inside of the outer cylindrical conductor around the spark gap.

3,653,767

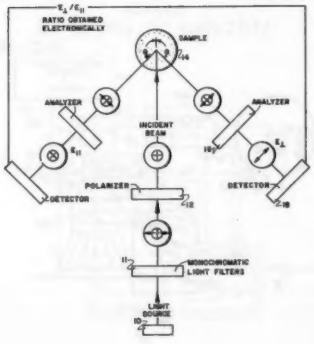
PARTICLE SIZE DISTRIBUTION MEASUREMENT USING POLARIZED LIGHT OF A PLURALITY OF WAVELENGTHS

John W. Liskowitz, Belle Meade, N.J., assignor to American Standard Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 629,568, Apr. 10, 1967, now abandoned. This application Nov. 12, 1968, Ser. No. 774,894

Int. Cl. G01n *15/02, 21/00, 21/40*

U.S. Cl. 356—102 **3 Claims**



This invention relates to the determination of particle size distributions in fluid mediums; and more particularly, to the use of a system in which polarized light is scattered by the particles and therefore depolarized, and the degree of depolarization is related to the particle size and wave-length of the light. In one form of the invention, the intensity of light which has its optical axis normal to that of the polarized light and which has been scattered in a backward direction, is measured and compared with the intensity of light which has its optical axis parallel to that of the polarized light and which has been scattered in the aforesaid direction. The ratio of the intensity of the normal polarity light to the parallel polarity light represents the degree of depolarization of the scattered light. The wave-length of the polarized light is varied while the concentration of particles in the fluid is held in constant. The particle size distribution is determined from changes in the degree of depolarization.

3,653,768

APPARATUS FOR MEASURING THE RANGE OF VISION BY COMPARING A DIRECT AND DISPERSED BEAM OF LIGHT

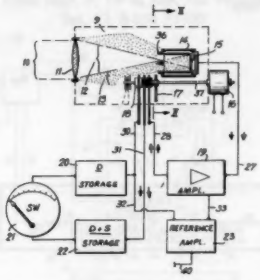
Franz Menke, Neckargemund, Germany, assignor to Eltro GmbH & Company, Heidelberg, Germany

Filed Feb. 16, 1971, Ser. No. 115,432

Claims priority, application Germany, Feb. 14, 1970, P 20 06 882.0

Int. Cl. G01n *21/00, 21/26, 21/22*

U.S. Cl. 356—104 **7 Claims**



A method and apparatus is disclosed which is usable in measuring the range of vision and comprises emitting a light beam from a transmitter for reception by a distant photoelectric receiver and indication on an indicator. A diaphragm serves to alternately feed to the receiver the direct light beam from the transmitter, and the combination of the direct light beam and a dispersed beam and the intensities of the signals are compared and indicated by the indicator.

3,653,769

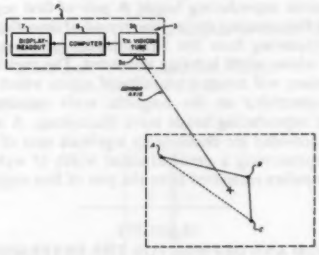
STADIAMETRIC RANGING SYSTEM

John D. Albright, Beltsville, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Mar. 6, 1970, Ser. No. 17,272

Int. Cl. G01b *11/26*

U.S. Cl. 356—141 **2 Claims**



Subject disclosure relates to a novel and improved system for determining the range and aspect of an aircraft or any other vehicle moving in three dimensions in relation to a fixed point. The system includes a fixed isoceles right triangular pattern laid out on the ground or an another suitable reference plane, an energy sensor detector on the aircraft that develops an image of triangular pattern, and determines the coordinates of the apices of the pattern, a computer on the aircraft that performs predetermined mathematical operations on the apex coordinate data from the sensor de-

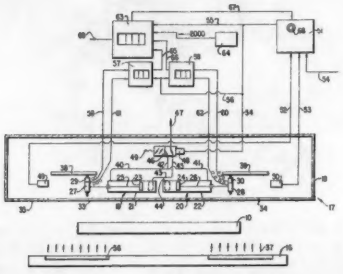
tector and a readout device on the aircraft that continuously provides range and aspect data that defines the position of the aircraft.

3,653,770

APPARATUS FOR MEASURING THE DIMENSIONS OF OBJECTS

Hiroshi Yamamuro, Yokohama, Japan, assignor to Tokyo Shibaura Co., Ltd., Kawasaki-shi, Japan

Filed June 2, 1970, Ser. No. 42,808
Claims priority, application Japan, May 12, 1969, 44/35993
Int. Cl. G01b *11/04*; G01n *21/30*
U.S. Cl. 356—160 **7 Claims**



Apparatus for measuring the dimensions of objects including elongated light sources within a measuring zone with the opposite ends of each of the light sources being arranged over each of the edge portions of a sheet of web material to be measured. The light sources are positioned adjacent one side of the web material in a non-contact relationship such that the lengthwise direction of the light sources is positioned so as to coincide with the widthwise direction of the web. A pair of photoelectric transducers are provided adjacent the opposite side of the web in a non-contact relationship therewith such that the transducers are permitted to move along the lengthwise direction of the light sources when measuring the width of the web. A pair of magnetic reproducing heads are provided to move simultaneously with the photoelectric transducers when the web is being measured. A pair of magnetic scale members are provided and extend for a distance which corresponds to the length of movement of the magnetic reproducing heads. A pair of first registers are provided for counting during the period of time that the light beams emanating from the light sources are interrupted by the web whose width is being measured. The registers, when in operation, will count a plurality of marks which are magnetically recorded on the magnetic scale members as the magnetic reproducing heads move therealong. A second register is provided for counting an algebraic sum of reference pulses representing a predetermined width of web material and both pulses emanated from the pair of first registers.

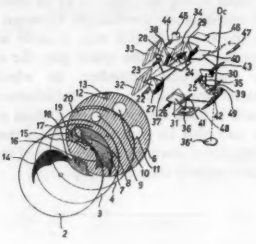
3,653,771

METHOD AND DEVICES FOR THE DETERMINATION OF COLORS AND COLOR TOLERANCES IN A VISUAL MANNER IN ANY KIND OF ARTIFICIAL LIGHT OR SUNLIGHT

Fritz Piringer, Stiege 10, 13 Graf Starhemberggasse, Vienna, Austria

Continuation of application Ser. No. 262,985, Mar. 5, 1963. This application Oct. 29, 1969, Ser. No. 872,427
Int. Cl. G01j *3/46*
U.S. Cl. 356—194 **26 Claims**

Color evaluation of a color sample is effected by producing in a simultaneous field of vision a plurality of separate color comparison regions each differing in color slightly from one another and juxtaposed with a multiplicity of images of a single small area of a color sample. The color of the sample images can be compared simultaneously with the colors of



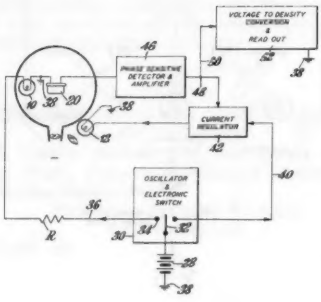
the comparison regions and a color attribute of the comparison regions varied until visual correspondence is obtained between the sample color and one of the comparison regions.

3,653,772

TWO LAMP LIGHT COMPARISON TYPE DENSITOMETER

Ralph L. Berge, Binghamton, N.Y., assignor to GAF Corporation, New York, N.Y.

Filed Aug. 19, 1969, Ser. No. 851,320
Int. Cl. G01n *21/22*, *21/48*
U.S. Cl. 356—205 **2 Claims**



Two lamps are lighted alternately at controlled intensities, both lamps illuminate a common sensor and the light path from one lamp includes the density to be measured. When a minimum differential is detected, the ratio of the currents in the lamps is a function of the density being measured and current in either one or both lamp is servo-controlled to minimize the differential. The current or voltage ratios are converted and read out as density values.

3,653,773

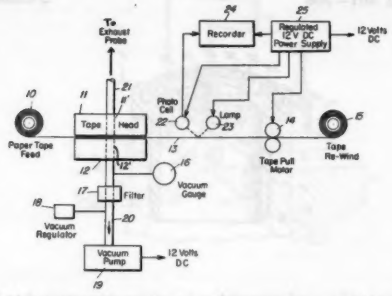
ANALYTICAL APPARATUS AND METHOD FOR SMOKES AND GASES

Elbert B. Childs, Hastings-On-Hudson, N.Y., assignor to Mobil Oil Corporation

Filed Mar. 16, 1970, Ser. No. 19,584
Int. Cl. G01n *21/28*
U.S. Cl. 356—207 **8 Claims**

Smoke is passed through a moving filter tape, and the darkness of the filtered trace due to solid, non-white con-

taminants is readout by photo-electric means. At least one resettable counter is provided to register the number of times



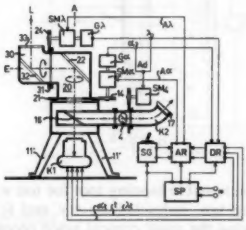
the smoke exceeds a smoke level for a predetermined period of time.

3,653,774

IMPROVEMENT OF OBSERVATION-AND-MEASURING THEODOLITE COMBINED WITH A PLURALITY OF STATIONARY EVALUATION DEVICES

Ulrich La Roche, Zurich, Switzerland, assignor to Contraves AG, Zurich, Switzerland

Filed Apr. 27, 1970, Ser. No. 32,122
Claims priority, application Switzerland, Apr. 30, 1969, 6574/69
Int. Cl. G01j *1/20;* **G02b** *27/32*
U.S. Cl. 356—254 **7 Claims**



An observation-and-measuring theodolite for moving objects which is of the type having at least one image evaluation device which can be directed at each section of a spherical segment surrounding the theodolite. There is provided servomotor means for rotating a housing about a stationary substantially vertical axis of rotation, with a first reflector surface being mounted in said housing at an inclination of 45° with respect to said axis of rotation. Further, an attachment housing is rotatably mounted at the aforesaid housing, this attachment housing possessing a light entry or passage window, and a second reflector surface is mounted in the attachment housing behind said light passage window. This second reflector surface is arranged at an inclination of 45° with respect to a horizontal axis passing through the center of said first reflector surface, with said first reflector surface being situated opposite said second reflector surface. Servomotor means serve to rotate the attachment housing about the horizontal axis connecting the centers of both reflector surfaces, and there is also provided at least one stationary evaluation device. The system is arranged such that light from each spherical segment section, towards which there is momentarily directed the light passage window in front of the second reflector surface, is reflected in the direction of the horizontal connection axis of the centers of both reflector surfaces and at said first reflector surface this light is reflected in the direction of its vertical axis of rotation and then is delivered to said at least one stationary evaluation device.

3,653,775

INSTRUMENTS TO SUPPLEMENT AND TAKE THE PLACE OF HANDS

James W. Ross, 4698 Zion Road, Cleves, Ohio

Filed Sept. 8, 1970, Ser. No. 70,384
Int. Cl. B43k *31/00*
U.S. Cl. 401—6 **42 Claims**

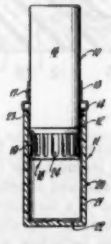
An instrument to supplement and take the place of hands. The instrument comprises a support means surrounding the operator's head with a first portion of the support means contacting the back of the operator's head and a second portion of the support means positioned ahead of the operator's chin. Tool holding means is affixed to the second portion of the support means and extends forwardly thereof. A tool is supported by the tool holding means. A tool actuator is affixed to the second portion of the support means and extends rearwardly thereof and in a position contactable by the operator's chin. The tool actuator is operatively connected to the tool whereby the tool may be manipulated by movement of the operator's head and through the interaction of the tool actuator and the operator's chin.

3,653,776

CARTRIDGE-TYPE LIPSTICK CONTAINER OR THE LIKE

Robert C. Geisel, Windsor, Conn., assignor to Eyelet Specialty Company, Wallingford, Conn.

Filed Jan. 7, 1970, Ser. No. 1,114
Int. Cl. A45d *40/06*
U.S. Cl. 401—86 **9 Claims**



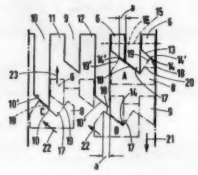
The invention contemplates an improved refill cartridge and insert construction for use in lipstick containers involving outer decorative casings, the insert being permanently assembled into the bore of the base of the outer decorative casing. The particular feature of the invention resides in locking

or detent action between a part of the base end of the refill cartridge and an inwardly projecting insert part which also has keyed rotary driving engagement with the base end of the cartridge. The nature of the action is such as to permit smooth insertion and removal of the cartridge with minimum transient distortion of the outer decorative casing. No residual stress is applied to the casing once the insertion or the removal of the cartridge has been completed.

3,653,777
CONTROL MECHANISM

Helmut Bross, Altenberg uber Nuremberg, Germany, assignor to J. Firma Jacob-Ritter KG, Brensbach Odenwald, Germany

Filed Feb. 14, 1968, Ser. No. 705,328
Claims priority, application Germany, July 22, 1967, B 93619
Int. Cl. B43k *5/16*
U.S. Cl. 401—110 16 Claims

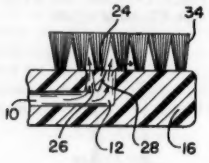


The invention provides a control mechanism for the advancing and withdrawal of a functioning part displaceable in a housing against or under the influence of a spring and for locking the part alternately in an advanced and withdrawn position. The mechanism is of a construction which enables it to be made relatively small and of a few parts, e.g. of injection molded plastic, so as to take up little space and is particularly suitable for use in a writing implement for advancing and withdrawing a writing cartridge within the housing of the implement.

3,653,778
APPLICATOR DEVICE FOR TOOTHPASTE DISPENSERS OR THE LIKE

John Robert Freiling, 4623 Davis Road, Perry, Ohio

Filed Apr. 16, 1970, Ser. No. 29,023
Int. Cl. A46b *11/02*; B43m *11/06*
U.S. Cl. 401—183 7 Claims

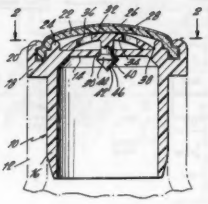


A disposable applicator device for use with toothpaste dispensers or the like including an elongated body having a bristle portion at one end and adapted to be detachably connected at its other end to a dispenser. The body including a passageway communicating the dispenser with the bristle portion. Orifice means including a baffle-like construction disposed in said passageway for selectively controlling the distribution of fluid material delivered from the dispenser to the bristle portion. A cap-like closure is detachably mounted over the bristle portion adapted to provide a protective cover therefor.

3,653,779
DISC VALVE FOR APPLICATOR

Gilbert Schwartzman, 20 Wilmot Circle, Scarsdale, N.Y.

Filed Mar. 30, 1970, Ser. No. 23,910
Int. Cl. B43m *11/06*
U.S. Cl. 401—206 3 Claims

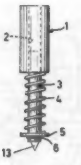


A fluid applicator comprising a retainer ring adapted to be seated in a container and having a peripheral flange which not only serves to hold a cover in place, but also maintains a disc valve assembly in a bowed convex position. The disc valve assembly engages the cover to normally hold the cover in a dome-like shape and has a depending stem which extends through an opening in the retainer ring and a valve head below the retainer ring normally urged into engagement with the retainer ring for controlling fluid flow.

3,653,780
TAPPING TOOL

Salvatore Ammatuna, 2859 Regnart Way, Santa Clara, Calif.

Filed Dec. 10, 1969, Ser. No. 883,813
Int. Cl. B23g *1/00, 1/48*; B23b *23/04*
U.S. Cl. 408—241 1 Claim



A manually actuatable tapping tool for use with a conventional threading tap, polysided at one end for a common hand stock having the usual conical sided recess or point on the axially facing surface of said end, said tool having a tubular sleeve for clamping within a chuck on a milling machine, drill press, lathe, and the like. A spindle reciprocable within said sleeve has a projecting end complementarily formed relative to said recess or point for engagement therewith for holding and aligning said tap and spindle, and a compressible spring around said spindle reacts between a radial projection on said tap and said sleeve to yieldably maintain said alignment and the engagement between said tap and spindle, when said sleeve is clamped within said chuck and the cutting end of the tap is in a hole to be threaded and when said spring is compressed.

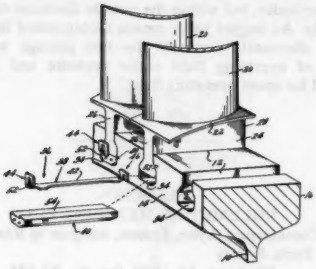
3,653,781
TURBOMACHINERY BLADE RETAINER

James Lee Cooper, Cincinnati, Ohio, assignor to General Electric Company

Filed Dec. 18, 1970, Ser. No. 99,391
Int. Cl. F01d *5/32*
U.S. Cl. 416—221 4 Claims

Means for retaining a blade in a turbomachinery rotor includes a locking clip and a spacer. The clip includes

preformed legs at each end which are adapted to abut the opposite sides and ends of the disc and blade root. One leg includes a preformed tab for retaining the spacer and is sized



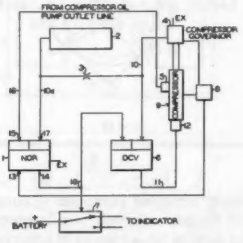
to permit insertion of the clip under the blade. The other leg includes a tab which is formable from a position enabling insertion of the spacer under the blade to a position abutting and locking the spacer.

3,653,782

LOW OIL PRESSURE CONTROL SYSTEM FOR AIR COMPRESSORS

Ronald W. Coiner, Irwin, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed May 25, 1970, Ser. No. 40,145
Int. Cl. F04b *49/00*
U.S. Cl. 417—12 **2 Claims**



A low oil pressure protection system for an air compressor control wherein a logic device is utilized to render said compressor inoperable when low oil pressure occurs, and timing means actuated during normal restarting cycles of the compressor after normal governor controlled stopping, to override protection control by said logic device.

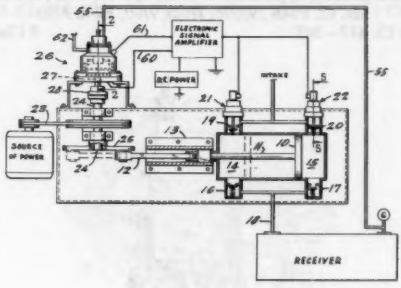
3,653,783

COMPRESSOR OUTPUT CONTROL APPARATUS

Earl R. Sauder, Mt. Vernon, Ohio, assignor to Cooper Industries, Inc., Houston, Tex.

Filed Aug. 17, 1970, Ser. No. 64,398
Int. Cl. F04b *49/02*
U.S. Cl. 417—298 **11 Claims**

A control apparatus for selectively varying the output of a reciprocating compressor by holding open its suction valves for variable periods during the piston cycle. The apparatus includes a signal generating means for applying successive signals to a transducer which holds open the suction valves for a period proportional to the interval between signals. The signal generator has a rotating bar driven in timed proportion to crankshaft speed and first and second signal generating pickups positioned adjacent the path of the rotating bar so that passage thereby generates an output signal. The angular position of the second signal pickup is selectively varied to vary the time interval between signals and thus the time



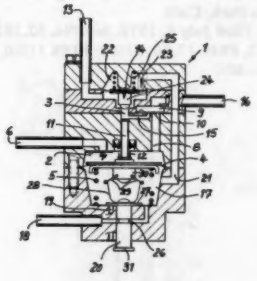
within the piston cycle that the compressor is unloaded. The angular position can be manually varied or automatically varied in response to changes in compressor output through a fluid pressure responsive actuator.

3,653,784

PROPORTIONATING FEED PUMP

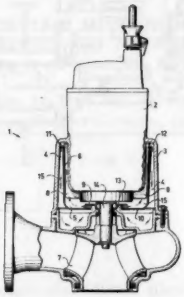
Wulf Leitermann, and Gerhard Maurhoff, both of Neckarsulm, Germany, assignors to Audi Nsu Auto Union Aktiengesellschaft, Neckarsulm, Germany

Filed June 16, 1970, Ser. No. 46,778
Claims priority, application Germany, June 18, 1969, P 19 30 811.3
Int. Cl. F04b *9/00*
U.S. Cl. 417—317 **2 Claims**



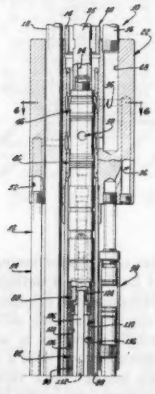
The invention relates to a proportioning pump for feeding at least two different liquids in a definite flow proportion. The pump has two interconnected displacement members executing their suction strokes and their delivery strokes simultaneously, each of which members is arranged in its own working chamber communicating with a suction and a pressure line by oppositely acting check valves. In accordance, with a particular application, this pump is employed in internal combustion engines with mixed lubrication for proportioning the fuel and oil, with the fuel-oil mixture being supplied to the float chamber of a carburetor.

3,653,785
PUMP UNIT
Jens Karl Adolf Dahlgren, Stockholm, and Bengt-Ake Rudolf Brandt, Mariehall, both of Sweden, assignors to Stenberg-Flygt AB, Solna, Sweden
Filed Apr. 7, 1970, Ser. No. 26,262
Claims priority, application Sweden, Apr. 18, 1969, 5556/69
Int. Cl. F04b *39/006*; **H02k** *9/00*; **F24h** *3/00*
U.S. Cl. 417—367 **5 Claims**



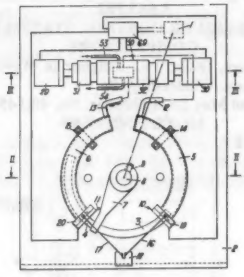
Pump unit for pumping polluted liquid such as sewage water, comprising a motor housing, which at least partially is surrounded by a cooling jacket forming a cooling liquid compartment, which is closed and, by means of a partition surrounding the motor housing, divided into an outer and an inner part which parts at the ends of the partition, viewed in the axial direction of the motor housing communicate with one another to permit circulation of the cooling liquid, so that inside the partition the cooling liquid flows in one direction and outside the partition in the opposite direction.

3,653,786
FLUID OPERATED PUMP ASSEMBLY WITH TANDEM ENGINES
Ralph F. McArthur, Huntington Park, and Melle F. Geurts, Los Angeles, both of Calif., assignors to Kobe, Inc., Huntington Park, Calif.
Filed July 6, 1970, Ser. No. 52,382
Int. Cl. F04b *17/00*, *35/00*; **F15b** *11/00*, *13/00*
U.S. Cl. 417—404 **3 Claims**



A fluid operated, tandem engine, pump assembly for oil wells comprising upper and lower fluid operated, reciprocating engines and a reciprocating pump arranged in tandem with the pump below the lower engine. Two passage means respectively interconnect the upper ends and the lower ends of the two engine cylinders. The two passage means include large-area vertical passages radially outwardly of the upper engine cylinder, but within the outside diameter of the pump assembly. An engine valve means incorporated in the upper engine alternately connects the two passage means to a source of operating fluid under pressure and a point of disposal for spent operating fluid.

3,653,787
VOLUMETRIC METERING PUMP
Roger Commarmot, Lyon, France, assignor to Rhone-Poulenc S.A., Paris, France
Filed Oct. 23, 1970, Ser. No. 83,525
Claims priority, application France, Oct. 23, 1969, 6936425
Int. Cl. F04b *35/04*, *21/02*, *39/10*, *17/00*
U.S. Cl. 417—415 **8 Claims**

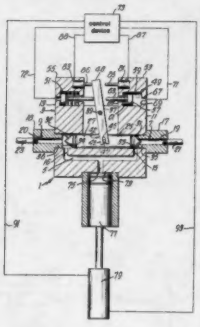


A volumetric metering pump for accurately dosing small quantities of liquid, in which two interconnected identical part-toroidal pistons are arranged in separate cylinders. Small pulse jerks are simultaneously applied to each piston by a rockable member connected to a step-by-step electric motor, so that one piston draws liquid into its cylinder while the other piston expels liquid from its cylinder. This pistons are thus caused to move along arcuate strokes in the direction of their respective axes. A slide valve is provided firstly to direct liquid from an inlet duct to one cylinder and to an outlet duct from the other cylinder. At the end of each stroke this situation is reversed.

3,653,788
METERING PUMP
Edward I. Klein, Montreal, Quebec, Canada, assignor to V-Mark Automation Ltd., Montreal, Quebec, Canada
Filed Apr. 6, 1970, Ser. No. 25,890
Int. Cl. F04b *7/02*, *39/08*, *21/02*, *39/10*
U.S. Cl. 417—508 **12 Claims**

A metering pump having a passageway in the pump body, an inlet and outlet connected to the passageway and a valve member slidable between the inlet and outlet to alternatively open and close them. A chamber, the volume of which is changed by movement of a piston in the chamber, is con-

nected to the passageway intermediate the inlet and outlet. Movement of the piston causes pumping of predetermined



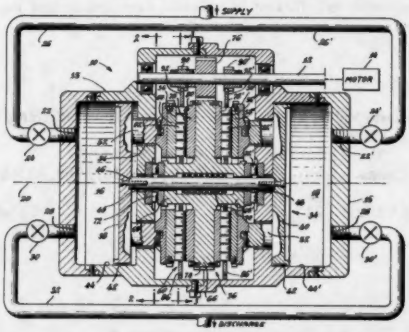
amounts of fluid through the passageway, the movement of the piston controlled by the position of the valve member.

3,653,789

POWERFUL POSITIVE DISPLACEMENT RECIPROCATING PRESSURIZING DEVICE AND METHOD AND MEANS FOR CONTINUOUSLY VARYING THE PRESSURIZING STROKE

Arthur M. Maroth, 46 Grumman Hill Road, Wilton, Conn.

Filed Apr. 22, 1970, Ser. No. 30,663
Int. Cl. F04b *21/02*
U.S. Cl. 417—534 **14 Claims**



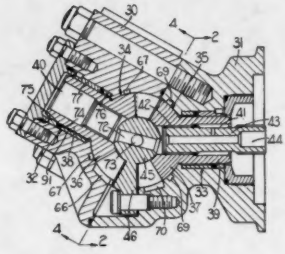
A powerful positive displacement reciprocating pressurizing device is described for use as a liquid pump or gas compressor capable of generating immense fluid pressures with significant volume flow. A double piston pump is shown driven by a rotating input member with inclined planes operatively interposed between the rotating input member and the pistons. The inclined planes are located as undulations on cam surfaces with peaks and valleys. Antifriction elements driven by the rotating input member roll over the undulations to thereby actuate the pistons in a reciprocating manner. A powerful positive displacement reciprocating apparatus and method for pressurizing fluids with continuously variable strokes at any desired operating speed is disclosed.

3,653,790

LIQUID PUMP OR MOTOR

Richard Joseph Ifield, Beecroft, Australia, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed May 13, 1970, Ser. No. 36,804
Int. Cl. F01c *1/08*; F03c *3/00*; F04c *1/04*
U.S. Cl. 418—73 **3 Claims**



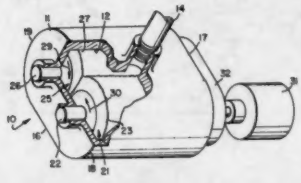
A hydraulic pump or motor, of the type which operates by the meshing of gears, has a pair of meshed bevel gears. The housing of the pump or motor has ports on either side of the zone where the teeth are in mesh. Within the zone where the teeth are out of mesh there is an arrangement for closing off the spaces between the teeth. Fluid under pressure is admitted to the bearing surfaces of the gears so as to oppose loads applied to the gears by the operating hydraulic fluid pressure.

3,653,791

FLUID MOVING DEVICE

Lyle E. McCoy, 533 N. Whitehall Road, Norristown, Pa.

Filed Sept. 2, 1970, Ser. No. 69,033
Int. Cl. F01c *5/02*
U.S. Cl. 418—153 **6 Claims**



A carrier movable about an endless path in one direction from an inlet to an outlet and in the other direction from an outlet to an inlet, at least a portion of the carrier being of resiliently compressible permeable material, and compressing means along said other direction of the path to compress the resilient carrier portion and expel therefrom fluid toward the outlet, the elastic carrier portion expanding in the direction from the inlet toward the outlet to absorb fluid and transfer the same.

ERRATA

For Classes 425—307, 425—133 and 425—394 see: Patent Nos. 3,653,335 thru 3,653,337

3,653,792

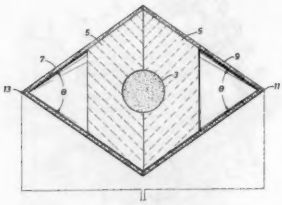
HIGH PRESSURE SHAPED CHARGED DEVICES

Donald R. Garrett, 314 Brookside, Bryan, Tex.

Continuation-in-part of application Ser. No. 870,323, , which is a division of application Ser. No. 708,331, Feb. 26, 1968, now Patent No. 3,499,732. This application Aug. 20, 1970, Ser. No. 65,599

Int. Cl. B29c *23/00*

U.S. Cl. 425—1 **10 Claims**



A high pressure shaped charge device having a predetermined external configuration for the explosive material, the configuration being calculated and shaped in such a manner as to optimize the force of an imploding pressure wave.

3,653,793

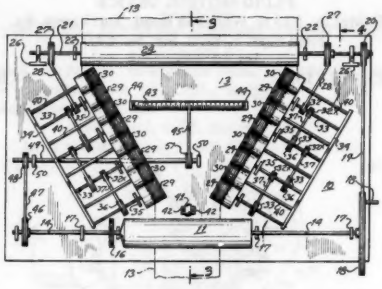
DEVICE FOR MAKING STRUDEL LEAF DOUGH SHEET

Leonhard Schafer, 2770 Briggs Avenue, New York, N.Y.

Filed July 27, 1970, Ser. No. 58,223

Int. Cl. A21c *3/00*

U.S. Cl. 425—328 **4 Claims**



This device stretches pastry dough simultaneously both laterally and longitudinally to form a moving gradually thinning sheet of said dough. In this device the dough sheet of relatively large thickness is fed into a set of front rollers to be then seized by a plurality of seizure rollers disposed in two rows in a divergent or V-shaped manner and engaging the respective opposing longitudinal edges of the dough sheet. The seizure rollers of each divergent row are provided with top and bottom rollers having grooved portions of mating relationship and adapted to seize the edge of said dough sheet. The speed of the dough sheet is increased uniformly as it approaches the exit end of the device. This speed is attained by use of driven pulleys of suitable size connected to the grooved rollers. An idler and a driven roller is provided between the opposing rows of divergent rollers to support the center area of the gradually thinning dough sheet and thus prevent any tearing of it.

3,653,794

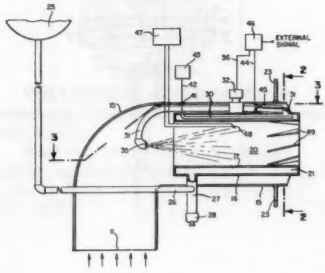
KEROSENE COMBUSTION BURNER

Hosein M. Shakiba, 4527 Walnut Street, Philadelphia, Pa.

Filed Mar. 19, 1970, Ser. No. 21,036

Int. Cl. F23d *11/44*

U.S. Cl. 431—208 **5 Claims**



A kerosene combustion burner for highly efficient fuel use is provided comprising an inner cylindrical combustion chamber surrounded concentrically by an outer cylinder, forming therebetween a fuel supply chamber wherein the fuel is heated and transformed to superheated vapor which is controllably fed through a nozzle and introduced into the combustion chamber where, in its vaporized form it burns efficiently. In operation, heating elements in the fuel supply chamber initially cause vaporization of the fuel, with temperature sensor means permitting passage of vapor to the nozzle when the temperature has acquired a predetermined value, and turning off said heating elements when the heat of combustion is sufficient to maintain vaporization and steady state operation.

3,653,795

SURFACE BURNER SYSTEMS

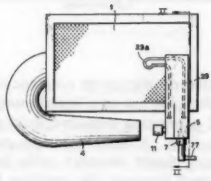
Gregorio Villini, Trieste, Italy, assignor to Italo Pellizzetti, Turin, Italy

Filed Feb. 16, 1970, Ser. No. 11,603

Claims priority, application Italy, Feb. 18, 1969, 60306

Int. Cl. F23d *11/44*

U.S. Cl. 431—247 **5 Claims**

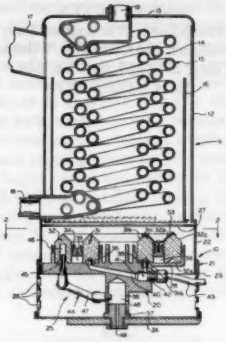


A surface burner system designed to be fed by fuel in liquid form. There are a conventional mixing chamber having a panel through which a fuel-air gas mixture may pass for

combustion at the panel surface, and a venturi into which air and gaseous fuel pass to enter the mixing chamber. The invention provides a vaporiser located near the panel and arranged to be heated by it. The vaporizer contains chamber in which liquid fuel under pressure boils, the vapor passing through an injector nozzle to reach the venturi tube. The flow from the injector nozzle to the venturi can be controlled by manual control means. An electrical resistor preheats the vaporizer body for start-up.

3,653,796
BURNER FOR A HEATER
Robert L. Kercher, Fabreville, Quebec, and Dugald J. Telfer, Chomedy, Quebec, both of Canada, assignors to Vapor Corporation, Chicago, Ill.
Filed July 24, 1970, Ser. No. 57,902
Int. Cl. F23d *13/12*
U.S. Cl. 431—328 **5 Claims**

A heater for heating water including a burner having a pair of concentrically arranged porous ceramic wicks capable of



permitting proper combustion of fuels and not being adversely affected by water and foreign matter.

CHEMICAL

3,653,797
DYEING HAIR WITH AN AQUEOUS FILM-FORMING RESIN COMPOSITION
Carroll R. Reiss, Green Township, Hamilton County; Arthur W. Forbriger, Indian Hill Village, and Kanu I. Patel, Cincinnati, all of Ohio
Continuation-in-part of application Ser. No. 470,920, July 9, 1965, now abandoned , Continuation-in-part of application Ser. No. 264,747, Mar. 13, 1963, now abandoned. This application May 21, 1970, Ser. No. 39,540
Int. Cl. D06p *5/00*
U.S. Cl. 8—10 **2 Claims**

Temporarily dyeing hair with a composition including an aqueous solution of a non-ionic water-soluble film-forming resin, benzyl alcohol, and an anionic dyestuff having an affinity for hair fibers dispersed therein, there being sufficient benzyl alcohol in the solution to render the dyestuff substantially equally adsorbed on more damaged and less damaged hair sections.

3,653,798
PROCESS FOR THE DYEINGS OF BLENDS OF SPANDEX FIBERS AND POLYAMIDE FIBERS
George Leslie Boardman, Manchester, England, assignor to J. R. Geigy A.G., Basel, Switzerland
Filed Jan. 3, 1968, Ser. No. 695,354
Claims priority, application Great Britain, Jan. 7, 1967, 1,034/67
Int. Cl. D06p *1/00, 3/82*
U.S. Cl. 8—15 **9 Claims**

Process for dyeing blends of spandex and polyamide fiber materials in which the blended material is first pretreated with an agent for retarding drawing of the dyestuff on to the polyamide fiber portion in the blend; the thus pretreated material is then entered into another bath containing the dyestuff and an organic compound, which is a solvent for the dyestuff, or the dyestuff and the last-mentioned organic compound are added to the bath in which the pretreatment with retarder has taken place, whereupon the bath and goods therein are treated in a first stage to a temperature of from about 40° up to 70° C. for about 40 to 60 minutes and then at a temperature above 80° C., and preferably between 90° and 95° C., i.e., below the boiling point of the bath for approximately another 30 minutes to 2 hours.

3,653,799
PROCESS FOR COATING AND DYEING POLYOLEFIN FIBERS
Karl F. Schimmel, Verona, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed Aug. 1, 1968, Ser. No. 749,264
Int. Cl. D06p *5/00*
U.S. Cl. 8—18 **10 Claims**

Process of dyeing polyolefin textile fibers which comprises coating a polyolefin textile fiber or fabric with an adherent coating of an interpolymer comprising a non-rubbery interpolymer of a polyunsaturated hydrocarbon monomer and at least one monoolefin monomer having a single copolymerizable ethylenic group, said interpolymer having an essentially saturated carbon chain containing a substantial proportion of the total carbon atoms in the polymer molecule and containing sufficient ethylenically unsaturated groups in the polymer molecule to permit substantial curing of films thereof by oxidative mechanism, then contacting the coated fiber with an organic dye, preferably a dye selected from the group consisting of disperse dyes, cationic dyes, and premetallized dyes.

3,653,800
UNIFORMLY DYED RED TO GREEN WATER SWELLABLE CELLULOSIC FIBERS
John Blackwell, Kennett Square, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Nov. 25, 1969, Ser. No. 879,900
Int. Cl. D06p *3/82, 1/20*
U.S. Cl. 8—21 C **3 Claims**

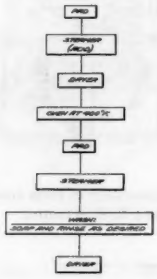
Water swellable cellulosic fibers, for example, cotton, or blends or mixtures thereof with synthetic fibers, for example, polyester fibers, uniformly dyed to red to green shades with essentially water insoluble, non-vattable, 1,(4,5 or 8)-di(N-substituted)aminoanthraquinone dyes, for example, 1,4-bis(N-hexylamino)anthraquinone, said dyed fibers being fast to washing, drycleaning, crocking and in many instances, sublimation, and having a reflectance color value (S') after scour of at least about 2.

3,653,801

PAD-ACID STEAM NYLON-COTTON BLEND WITH ACID AND VAT DYES

Ibrahim Ahmed Aboul-Saad, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 29, 1967, Ser. No. 664,028
Int. Cl. D06p *3/82*
U.S. Cl. 8—21 B **8 Claims**



A process for dyeing nylon/cotton textile fabrics which comprises:

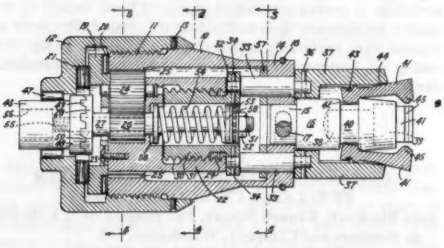
1. co-applying the vat and acid dyes at a pH of 4–8,
2. steaming the fabric in the presence of a volatile organic acid,
3. drying the fabric, and
4. fixating the vat dye in a conventional manner, has been found to give a union shade in a continuous manner with good utilization of the dye applied.

3,653,802

NUT CRIMPING TOOL

Lowell Warner Weiss, 274 Vine Street, Denver, Colo.

Filed Nov. 18, 1970, Ser. No. 90,566
Int. Cl. B23p *19/00, 19/04*
U.S. Cl. 29—200 B **8 Claims**



A motor driven tool provided with a rotatable socket for threading a nut upon a bolt and having clamping jaws for crimping the nut in place on the bolt, the clamping jaws being actuated by axial movement of an encircling jaw cup to which axial movement is imparted by threads which are driven from a motor driven tool through the medium of planet gears so that the socket will first torque the nut on the bolt and the jaw cup will then move against the jaws to engage and radially clamp the nut upon the bolt.

3,653,803

POLYOLEFIN AND ETHYLENE-AMINO ACRYLATE COPOLYMER BLEND DILUTE ACID SCOURED AND DYED

Clarence Frederick Hammer, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 11, 1969, Ser. No. 884,311
Int. Cl. D06p *3/00*
U.S. Cl. 8—31 **13 Claims**

A process for acid dyeing polyolefin (isotactic polypropylene) shaped articles such as fibers is provided which gives full penetration of dye to heavy denier round fibers in relatively short periods of time as well as adequate penetration of very heavy tape and fibrillated film fibers. This process comprises (1) extruding a uniform blend of the polyolefin with about 2 to 15 percent by weight of a thermoplastic, essentially compatible nitrogen-containing polymer such as a copolymer of ethylene and dimethylaminoethyl methacrylate into fibers, (2) exposing the fibers to an aqueous prescour solution which contains about 3 to 200 percent, on weight of fiber, of various scour materials, preferably sodium bisulfate, and optionally a nonionic surfactant, at a temperature of about 80° to 1290° C., and (3) exposing the fibers to an acid dye bath, containing an acid dye, a premetallized dye, a disperse dye or mixtures thereof.

3,653,804

BLEACHING OF WOOD PULP WITH DITHIONITE SOLUTION STABILIZED BY ZINC COMPOUND

Alfons Janson, Ludwigshafen, Rhine; Franz Poschmann, Limburgerhof/Pfalz, and Georg Wittmann, Ludwigshafen, Rhine, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen, Rhine, Germany

Filed Dec. 26, 1967, Ser. No. 693,280
Claims priority, application Germany, Dec. 31, 1966, P 15 46 239.2
Int. Cl. D06l *3/10;* **D21c** *9/10;* **C11d** *7/54*
U.S. Cl. 8—110 **2 Claims**

Use of sparingly soluble zinc compounds for prolonging the stability of wood pulp bleaching solutions containing dithionites.

3,653,805

DELAYED CURE PROCESS USING FORMALDEHYDE VAPOR TO CAUSE CREASEPROOFING

Jose P. Gamarra, La Palma; Ronald Swindler, Pasadena, and Katherine W. Wilson, South Pasadena, all of Calif., assignors to Cotton, Incorporated, Memphis, Tenn.

Filed Sept. 24, 1968, Ser. No. 762,119
Int. Cl. D06m *1/16, 13/14, 13/54*
U.S. Cl. 8—116.4 **12 Claims**

Cellulosic materials such as cotton fabrics, preferably preimpregnated with an amide such as urea, are treated with formaldehyde vapor, formed into garments and cured in the presence of a catalyst to impart durable press and wrinkle recovery characteristics to such garments. The required curing catalyst may be furnished either by impregnating the fabrics with an aqueous solution of a weakly acid salt such as zinc chloride after exposure of the fabric to formaldehyde and before garment fabrication therefrom, or by furnishing a gaseous catalyst such as sulfur dioxide to the chamber in which the garments fabricated from the formaldehyde-treated fabric are cured.

3,653,806

TREATMENT OF POLYAMIDE FIBROUS MATERIAL WITH TITANIUM TRICHLORIDE

Shogo Matsuda, Toyonaka-shi, Osaka; Yutaka Shimodoi, Suita-shi, Osaka; Takeo Oshima, Ibaragi-shi, Osaka, and Kazushi Ochi, Neyagawa-shi, Osaka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 12, 1967, Ser. No. 689,814
Claims priority, application Japan, Dec. 15, 1966, 41/82307
Int. Cl. D06m *3/30, 3/40*
U.S. Cl. 8—130.1 22 Claims

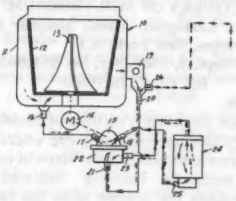
A method for processing polyamide fibrous material, especially nylon products, wherein the fibrous material is treated with a solution or dispersion including $TiCl_3$ and polyethylene, thereby providing the material with full-dullness and non-waxy touch.

3,653,807

METHOD AND MEANS FOR SHREDDING AND FILTERING LINT IN A WASHING MACHINE

Clark I. Platt, Benton Harbor, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Aug. 24, 1970, Ser. No. 66,252
Int. Cl. D06f *39/10*
U.S. Cl. 8—158 11 Claims



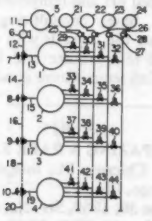
Method and apparatus for treating lint in an automatic washing machine assembly, the apparatus including a shredder which continuously chops up strands of lint before delivering the same to the washing machine filter, and then operates to chop up lint which is back-flushed from the filter before discharging the same.

3,653,808

METHOD FOR AUTOMATICALLY TREATING TEXTILE MATERIAL

Kazutomo Ishizawa, Osaka-shi, Osaka; Tetsujiro Kubota, Mie-ken; Jiro Miki, Higashiosaka-shi, Osaka; Hirotsugu Matsunaga, Mie-ken, and Sadao Ohtake, Hyogo-ken, all of Japan, assignors to Kanegafuchi Boseki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 28, 1969, Ser. No. 819,773
Claims priority, application Japan, Sept. 24, 1968, 43/68519; 43/68523; Nov. 20, 1968, 43/84509; Nov. 25, 1968, 43/86034; Dec. 21, 1968, 43/93478
Int. Cl. D06f *31/00, 33/02*
U.S. Cl. 8—158 7 Claims



This is a method and apparatus for automatically treating textile material contained within more than two batch-type treating baths, the following treating operations are successively carried out at a stage fixed in an automatic treating program in which each operational stage for each bath is set with a specified time lag from each other so that each bath operation can be independently carried out; (1) water feeding, (2) feeding of main treating liquid into each bath, (3) distribution of auxiliary treating liquid into each bath, (4) recycling of liquid in the bath and (5) discharging of the liquid from the bath; each treating operation comprises new arts for the convenience of automatic treating. The apparatus comprises a main treating liquid feeding system containing a main treating liquid vessel and means for feeding the main liquid into each bath, an auxiliary treating liquid distribution system comprising more than one auxiliary treating liquid vessel and means for distribution of the auxiliary liquid into each bath, and means for automatically operating the systems so that each operation for each bath can be independently carried out in accordance with the automatic treating program.

3,653,809

PROCESS FOR THE REMOVAL OF ACIDIC CONSTITUENTS FROM GASEOUS MIXTURES

Klaus Wehner; Horst Grunert, both of Leuna; Werner Kisan, Halleneustadt; Gerhard Esser, Leuna; Horst Knopel, Leipzig, and Dietmar Flad, Zoschen, all of Germany, assignors to VEB Leuna-Werke Walter Ulbricht, Leuna, Germany

Filed Mar. 9, 1970, Ser. No. 17,859
Int. Cl. B01d *53/34, 53/16*
U.S. Cl. 23—2 A 4 Claims

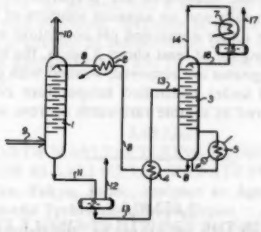
Acidic constituents are removed from gaseous mixtures by washing with a solvent which comprises a N-substituted ϵ-caprolactam. The solvent may also contain water and/or an alkanolamine. These solvents are advantageous, because, even in the presence of water, they cause no corrosion.

3,653,810

PROCESS FOR A FINE PURIFICATION OF HYDROGEN-CONTAINING GASES

Karl Bratzler, Bad-Homburg; Alexander Doerges, Oberursel; Gerhard Hochgesand, Neu Isenburg, and Gerhard Grunewald, Mainz-Mombach, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt (Main), Germany

Continuation-in-part of application Ser. No. 697,544, Dec. 12, 1967, now abandoned. This application Sept. 8, 1970, Ser. No. 70,261
Claims priority, application Germany, Dec. 16, 1966, M 72045
Int. Cl. B01d *47/00*
U.S. Cl. 23—2 R 5 Claims



Removal of carbon dioxides from gases containing such by contacting said gases with a solution of a monoalkyl amine, a dialkyl amine, an alkanol amine or an alkylene diamine in methanol at below about 0° C. wherein said amine is present in solution in a concentration of 0.005 to 0.3 mol percent.

3,653,811

METHOD OF REMOVING HYDROGEN HALIDES FROM SULPHUR DIOXIDE GAS

Maina Konstantinovna Zagorskaya; Alexandr Ilich Volikh, both of ulitsa Kholturiva, 5A, kv. 93, Ryazan; Lev Izrailevich Mekler, ulitsa Proletarskaya, 5, kv. 42, Karagandinskaya, Obl., Balkhash, and Vladimir Ivanovich Ksenzenko, Naberezhnaza 40, kv. 46, Moscow, all of U.S.S.R.

Filed Mar. 6, 1969, Ser. No. 805,035
Int. Cl. C01b *17/60, 17/56*
U.S. Cl. 23—2 **2 Claims**

A method of removing hydrogen halides from sulphur dioxide gas by absorbing said impurities with anion exchange resins in salt form.

3,653,812

PROCESS FOR REMOVAL OF SULFUR DIOXIDE FROM GAS STREAMS

Raymond T. Schneider; James A. Taylor, and William D. Wilis, all of Lakeland, Fla., assignors to Wellman-Lord, Inc.

Filed July 18, 1969, Ser. No. 843,163
Int. Cl. C01b *17/60;* **C01d** *5/00*
U.S. Cl. 23—2 SQ **23 Claims**

The disclosure is of an improvement in a sulfur dioxide removal process wherein a sulfur dioxide-containing gas is contacted with an aqueous absorbing solution of a metal sulfite, e.g., sodium sulfite, to yield a spent absorbing solution of metal bisulfite, and the latter is subjected to conditions of temperature, pressure and residence time in a desorption zone sufficient to decompose the bisulfite to the sulfite, sulfur dioxide and water, with the water and sulfur dioxide being evaporated and the sulfite precipitated from solution. The precipitated sulfite is separated from its mother liquor and dissolved in water and the resultant solution is recycled as fresh absorbing solution. The improvement comprises recycling to the desorption zone the major portion, preferably substantially all, of the mother liquor from which the precipitated sulfite has been separated.

3,653,813

PROCESS FOR PREPARING RARE EARTH NORMAL TUNGSTATES

Vincent Chiola; George J. Kamin, and Clarence D. Vanderpool, all of Towanda, Pa., assignors to Sylvania Electric Products Inc.

Filed June 24, 1970, Ser. No. 49,570
Int. Cl. C22b *59/00*
U.S. Cl. 23—15 W **12 Claims**

Rare-earth normal tungstates are prepared by reacting soluble rare-earth salts and an aqueous solution of ammonium metatungstate under controlled pH conditions and agitation. After agitating for at least about 3 hours, the solid rare-earth normal tungstates are removed, washed with deionized water, and dried under controlled temperature conditions. Especially preferred as soluble rare-earth sources are oxides and carbonates.

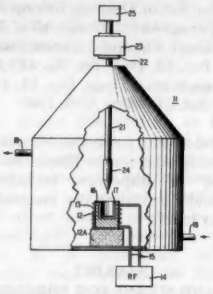
3,653,814

TECHNIQUE FOR THE GROWTH OF SINGLE CRYSTAL LEAD MOLYBDATE

William Adam Bonner, Scotch Plains, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 3, 1970, Ser. No. 60,332
Int. Cl. C22b *59/00;* **B01j** *17/18*
U.S. Cl. 23—15 W **5 Claims**

Large single crystals of lead molybdate of high optical quality are grown by pulling from a melt under conditions of low thermal gradient in a direction approximately 30° off the *c*-axis. Conventional growth technique on either the *a*- or *c*-axis have not proven to yield satisfactory crystals from the standpoint of magnitude or yield.



3,653,815

RECOVERY OF MOLYBDENUM

Roald R. Skarbo, Lexington, Mass., assignor to Kennicott Copper Corporation, New York, N.Y.

Filed Sept. 3, 1969, Ser. No. 855,006
Int. Cl. C22b *59/00*
U.S. Cl. 23—15 W **7 Claims**

The specification describes a method of recovering molybdenum from molybdenum containing ore wherein the ore is subjected to the conventional process steps of concentrating, roasting, and ammonia leaching followed by novel procedures to remove the copper from the leach solution without the necessity of adding an agent to precipitate the contaminant copper. The copper contaminate in the leach solution is precipitated out of the solution by (1) partial evaporation of the leach solution followed by dilution back to about its original volume, and (2) stream stripping of the leach solution until precipitation of the copper complex is complete.

3,653,816

PRODUCTION OF AMMONIUM METAVANADATE

James E. Mathers, Ulster; Felix F. Mikus, Towanda, and Ramon L. Yale, Ulster, all of Pa., assignors to Sylvania Electric Products Inc.

Filed May 28, 1970, Ser. No. 41,562
Int. Cl. C22b *59/00*
U.S. Cl. 23—19 V **7 Claims**

A highly pure ammonium metavanadate with improved particle size and bulk density is produced from an impure ammonium metavanadate by dissolving the impure ammonium metavanadate in water, maintaining controlled temperature conditions for a period of time, filtering, maintaining the filtrate under controlled pH and temperature conditions for a specified period of time, crystallizing solid ammonium metavanadate, washing the crystals with water, vacuum drying under controlled temperature and heat treating under agitation and controlled temperature conditions.

3,653,817

METHOD FOR PREPARING A RARE EARTH PHOSPHOR

Israel A. Liberman, Chicago, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed June 30, 1969, Ser. No. 837,867
Int. Cl. C22b *59/00*
U.S. Cl. 23—21 **3 Claims**

A phosphor is prepared by conversion of a rare earth oxide, the rare earth element appearing in its normal trivalent

state in the oxide but in its bivalent state in the phosphor. The conversion is achieved by initially mixing, in their dry solid states, the oxide with a reducing agent and then heating the mixture in a vacuum. The composition of the agent is such that it is oxidized and forms part of the phosphor. An appropriate reducing agent, by way of example, is silicon monoxide, in which case the resulting phosphor constitutes a rare earth silicate.

3,653,818

PROCESS FOR THE SOLUBILIZATION OF CALCIUM BORATE PRESENT IN BORON MINERALS

Pierre Mathis, Dombasle-sur-Meurthe, France, assignor to Solvay & Cie, Brussels, Belgium

Filed July 8, 1970, Ser. No. 53,157
Claims priority, application Great Britain, July 10, 1969, 34,848/69
Int. Cl. C01b *25/00*
U.S. Cl. 23—59 **6 Claims**

A calcium borate mineral is treated with an aqueous boric acid solution, whereby both the calcium components and boron components are dissolved.

3,653,819

PRODUCTION OF SODIUM CARBONATE

Hiroshi Shibata; Tomijiro Morita, and Satoshi Nakano, all of Iwaki-shi, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Continuation-in-part of application Ser. No. 580,338, Sept. 19, 1966, now abandoned. This application Oct. 23, 1969, Ser. No. 871,420
Claims priority, application Japan, Sept. 27, 1965, 40/58863; Dec. 29, 1965, 40/81318
Int. Cl. C01d *7/00*
U.S. Cl. 23—63 **5 Claims**

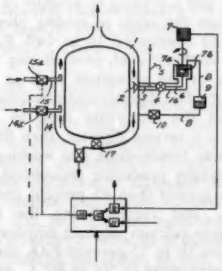
Process for producing sodium carbonate from the sodium amalgam of mercury-process salt electrolysis, wherein a caustic soda solution is reacted with carbon dioxide gas to produce sodium carbonate which is further subjected to crystallization and separation and a mother liquid resulted from the crystal separation is recirculated to a denuding device.

3,653,820

PROCESS FOR CONTROLLING THE PRODUCTION OF ALKALI CYANIDE SOLUTIONS

Hans-Dietrich Kobs, Surth; Klaus Schmidt, Bruhl; Theodor Zarfl, Wesseling, and Gunter Kuhn, Cologne-Zollstock, all of Germany, assignors to Deutsche Gold-und Silber, Scheideanstalt vormals Raessler, Frankfurt Main, Germany

Filed Feb. 17, 1969, Ser. No. 799,570
Claims priority, application Germany, Feb. 24, 1968, P 16 67 785.3
Int. Cl. C01c *3/10*; C01g *1/00*; G01n *33/00*
U.S. Cl. 23—79 **6 Claims**



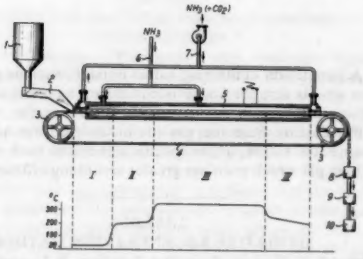
The continuous production of aqueous alkali cyanide from hydrocyanic acid and aqueous alkali is controlled by measuring the viscosity and adding alkali or hydrocyanic acid to keep the viscosity constant. An Apparatus for carrying out the method is also disclosed. The lines for adding hydrocyanic acid and alkali are controlled through the viscosity measuring mechanism.

3,653,821

PROCESS FOR THE MANUFACTURE OF AMMONIUM POLYPHOSPHATES

Gero Heymer; Wilfried Gerhardt, both of Knapsack near Cologne, and Heinz Harnisch, Lovenich near Cologne, all of Germany, assignors to Knapsack Aktiengesellschaft, Knapsack near Cologne and Benckiser-Knapsack GmbH, Ludwigshafen/Rhine, Germany

Filed Apr. 9, 1969, Ser. No. 814,635
Claims priority, application Germany, Apr. 11, 1968, P 17 67 205.8
Int. Cl. C01b *25/28*
U.S. Cl. 23—106 **8 Claims**



Production of ammonium polyphosphates of the general formula $(NH_4PO_3)_n$, in which n is a number between 10 and 400, from ammonium orthophosphate, phosphorus pentoxide and, if desired, urea in contact with gaseous ammonia. A feed mixture produced from ammonium orthophosphate, phosphorus pentoxide and urea in the ratio of 1 mol ammonium orthophosphate: $(1-x/2)$ mol P_4O_{10}+mol urea), wherein x is a number between 0 and 0.5, is subjected to annealing treatment at temperatures between 200° and 340° C., for a minimum of 10 minutes and a maximum of 60 minutes, in contact with ammonia. Mixtures in which x is smaller than 0.25 are pretreated at temperatures lower than 190° C. for a period of time between 5 and 10 minutes, in an ammonia atmosphere.

3,653,822

METHOD OF MANUFACTURING HYDROGEN SULFIDE AND/OR ALKALI METAL SULFATE FROM SMELTS

Akio Mita, Tokyo, Japan, assignor to Agency of Industrial Science and Technology, Tokyo, Japan

Continuation-in-part of application Ser. No. 694,038, Dec. 28, 1967, now abandoned. This application June 3, 1970, Ser. No. 43,240
Int. Cl. C01d *5/00*; C01b *17/16*
U.S. Cl. 23—121 **1 Claim**

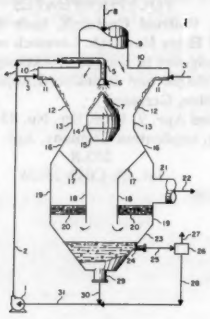
An alkali metal sulfate and hydrogen sulfide of high purity are obtained by causticizing, treating with sulfuric acid, and neutralizing smelt which is obtained by concentrating and burning Na-base sulfite pulp spent liquor or neutral sulfite semi-chemical spent liquor.

3,653,823

REMOVAL OF SULFUR DIOXIDE FROM GAS STREAMS

Indravadan S. Shah, 108-26 63rd Road, Forest Hills, N.Y., assignor to Chemical Construction Corporation, New York, N.Y.

Filed Feb. 27, 1970, Ser. No. 14,947
Int. Cl. C01f 5/42; C01b 17/48, 17/56
U.S. Cl. 23—129 6 Claims



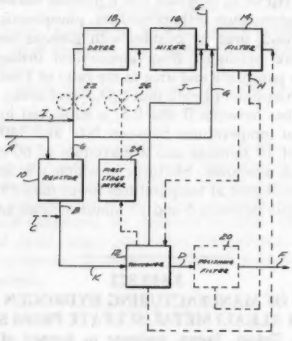
A gas stream containing sulfur dioxide, such as a waste or flue gas, is scrubbed with a circulating aqueous slurry containing magnesium oxide and magnesium sulfite, to remove sulfur dioxide from the gas stream in the form of hydrated magnesium sulfite, under specific conditions such as relatively high pH which promote greater scrubbing efficiency.

3,653,824

OXIDATIVE REGENERATION METHOD

Richard G. Barker, Princeton Junction, N.J., and James L. Ma, Los Angeles, Calif., assignors to Union Camp Corporation, New York, N.Y.

Filed Oct. 16, 1969, Ser. No. 867,057
Int. Cl. C01g 45/02
U.S. Cl. 23—145 11 Claims



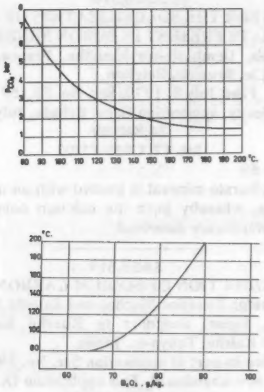
Process and apparatus for recovering and regenerating spent manganese oxidant in an aqueous stream by concentrating the spent oxidant to produce a thickened slurry, forming a charge of free-flowing granular particles from the slurry and oxidizing the charge. The stream may be thickened by employing a settling tank, formed into a charge in a solids mixer, and oxidized in a regeneration dryer.

3,653,825

PROCESS FOR THE MANUFACTURE OF BORIC ACID

Pierre Mathis, Dombasle-sur-Meurthe, France, assignor to Solvay & Cie, Brussels, Belgium

Filed Apr. 30, 1970, Ser. No. 33,291
Claims priority, application France, Apr. 30, 1969, 6913966
Int. Cl. C01b 35/00
U.S. Cl. 23—149 8 Claims



Boric acid is produced by treating a mixture of water and crude or calcined borocalcic ore with CO_2, the partial pressure of which is at least 1 bar, at a temperature above 80° C. and then separating the liquid phase from the solid phase under a pressure and temperature at least equal to those under which treatment with CO_2 was carried out. The pressure and temperature of the liquid phase are then decreased and the boric acid is crystallized from the liquid phase.

3,653,826

PROCESS FOR THE PRODUCTION OF PHOSPHORIC ACID AT A HIGH CONCENTRATION AND A GYPSUM BY-PRODUCT OF IMPROVED QUALITY

Toshio Ishihara; Takayoshi Okazaki; Tetsuzo Endo; Tanizawa Koichi, and Sataro Nakajima, all of Tokyo, Japan, assignors to Nissan Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 16, 1968, Ser. No. 762,210
Claims priority, application Japan, Sept. 21, 1967, 42/60253; Mar. 11, 1968, 43/15554
Int. Cl. C01b 25/22
U.S. Cl. 23—165 4 Claims

A process for the production of phosphoric acid at a high concentration and a gypsum by-product of improved quality which comprises the steps of mixing phosphate rock with phosphoric acid containing 36 to 44% P_2O_5, digesting the mixture with sulphuric acid, precipitating 70 to 80% of the calcium oxide in the phosphate rock as calcium sulphate hemihydrate in a first digester and precipitating all of the calcium oxide in the phosphate rock as calcium sulphate hemihydrate in a second digester, then filtering a slurry of calcium sulphate hemihydrate and washing the cake with a dilute acid, thereby producing phosphoric acid with a P_2O_5 concentration greater than 45 percent and phosphoric acid for digestion, and recrystallizing the calcium sulphate hemihydrate into calcium sulphate dihydrate in a mixed acid containing from 10 to 15 percent P_2O_5 and from 10 to 15% H_2SO_4 at a temperature of 50° to 80° C. and at a solids concentration of 20 to 45 percent, and then filtering and washing it, thereby producing a gypsum by-product containing less than 0.2% P_2O_5.

3,653,827

PRODUCTION OF WET PROCESS PHOSPHORIC ACID

Denis Hey, Mississauga, and Alfred Johannes Dieterman, Clarkson (Mississauga), both of Ontario, Canada, assignors to Emery Industries (Canada), Ltd., Toronto, Ontario, Canada

Filed Aug. 29, 1969, Ser. No. 854,317
Int. Cl. C01b 25/22
U.S. Cl. 23—165 4 Claims

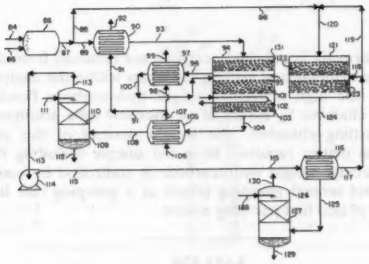
The yield of phosphoric acid in the "wet process" synthesis of said acid is improved by adding to the phosphate rock-sulfuric acid reaction medium a small but effective amount of a "processing aid," which also serves as a defoaming agent, comprised of a mixture of (1) an amide of a lower alkanol amine and fatty acid and (2) fatty acid, in specifically defined proportions as determined by the specific components of the composition.

3,653,828

DUAL ABSORPTION SULFURIC ACID PROCESS

John M. Connor, New York, N.Y., and Krikor D. Gureghian, Teaneck, N.J., assignors to Chemical Construction Corporation, New York, N.Y.

Filed Sept. 24, 1969, Ser. No. 860,519
Int. Cl. C01b 17/76
U.S. Cl. 23—168 6 Claims



A dual absorption sulfuric acid process is provided, with intermediate scrubbing of the process gas stream to remove sulfur trioxide, in which the residual gas stream after intermediate scrubbing is heated to a temperature which is about 10° C. to 50° C. higher than the temperature of the initial hot process gas passed into the first stage of catalysis. The sulfur dioxide content of the heated residual gas stream is thus catalytically oxidized to sulfur trioxide using reduced amounts of catalyst.

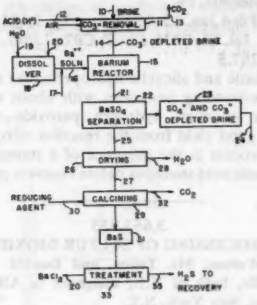
3,653,829

RECOVERY OF SULFUR VALUES FROM BRINE

Gideon P. Gelblum, Philadelphia, Pa., assignor to Catalytic Construction Company, Philadelphia, Pa.

Filed Jan. 29, 1970, Ser. No. 6,760
Int. Cl. C01b 17/16, 5/22
U.S. Cl. 23—181 9 Claims

Sulfur values are recovered, from a brine comprising sulfate ion, by contacting the brine with a brine-soluble barium compound in a direct reaction. A $BaSO_4$ precipitate results and this precipitate is separated, dried and calcined in a reducing atmosphere to convert it to BaS. The depleted brine may be either discarded or subjected to further treatment with a brine-soluble barium compound for recovery of metals therefrom. The BaS obtained from the process may then be treated in a variety of ways all of which have as their objective displacement of the sulfur, as H_2S, which may be directly recovered or converted to products such as sulfur and sulfuric acid. The various treatments disclosed provide for recycle of the barium ion into the initial phases of the process. Some of them, additionally, permit recovery of particular metal oxides or metal hydroxides from the brine as



well as conversion of alkali metals and alkali earth metal halides to their hydroxides or carbonates.

3,653,830

METHOD FOR MANUFACTURING ALUMINUM NITRIDE FIBERS

Katsutoshi Komeya, Kawasaki, and Hiroshi Inoue, Kawaguchi, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Apr. 27, 1970, Ser. No. 32,376
Claims priority, application Japan, May 8, 1969, 44/34812
Int. Cl. C01f 7/00; C01b 21/06
U.S. Cl. 23—192 5 Claims

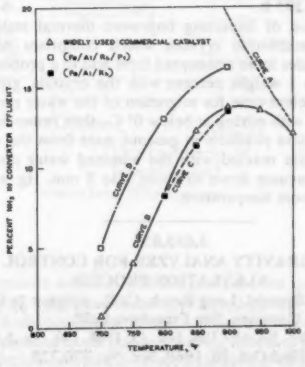
A method for manufacturing aluminum nitride fibers which comprises heating a mixture of aluminum nitride powders and aluminum powders to a temperature of 580° to 1,000° C. in an atmosphere consisting of nitrogen or ammonia gas with addition of halogens which creates an exothermic nitrification of aluminum heating the charge to above 2,000° C. and forming aluminum nitride fibers in high yield.

3,653,831

AMMONIA SYNTHESIS CATALYST

Robert L. Burnett, Pinole, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 4, 1968, Ser. No. 774,563
Int. Cl. C01c 1/04
U.S. Cl. 23—199 5 Claims



An improved ammonia synthesis catalyst containing platinum.

3,653,832

HYDROGEN PEROXIDE FROM ALKYLHYDROPEROXIDES

John O. Turner, West Chester, Pa., assignor to Sun Oil Company, Philadelphia, Pa.

Filed Jan. 13, 1970, Ser. No. 2,681
Int. Cl. C01b *15/02;* **C07c** *13/00*
U.S. Cl. 23—207.5 **5 Claims**

When aliphatic and alicyclic hydroperoxides are converted to their corresponding peroxides with about a 50 percent concentration of acid, hydrogen peroxide can also be recovered in good yield from the reaction mixture by carrying out the process in the presence of a stannate salt or an orthophosphoric acid stannous halide reaction product.

3,653,833

PROCESSING OF SULFUR DIOXIDE

William E. Watson, Mt. Tabor, and Donald A. Aubrecht, Bernardsville, both of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Dec. 9, 1969, Ser. No. 883,531
Int. Cl. C01b *17/04*
U.S. Cl. 23—226 **14 Claims**

Invention relates to a method for the reduction of sulfur dioxide with a reducing gas to elemental sulfur and/or other gaseous sulfur compounds in the presence of a catalyst and at a temperature within the range from 1,000° to 2,400° F., by passing a gaseous reaction mixture of a sulfur-dioxide containing gas with a reducing gas first through a contact chamber maintained at a temperature sufficient to raise the temperature of the mixture to 1,000° to 2,400° F., passing said heated gaseous reaction mixture through a reaction chamber containing a catalyst to produce a mixture comprising hydrogen sulfide, sulfur dioxide and sulfur, passing said product through a contact chamber containing contact means sufficient to absorb heat from said product stream to reduce the temperature of the product stream to about 700° to 800° F. and recovering the cooled product stream; said contact chambers being subjected to continuous alternating heat absorbing cycles while maintaining during the alternating cycles of the contact chambers the passage of the gaseous reaction mixture through the reaction chamber in the same direction through the catalyst bed.

3,653,834

STABILIZATION OF NITRONIUM PERCHLORATE

James E. Coleman, Edison Township, Middlesex County, N.J., assignor to Esso Research and Engineering Company, Linden, N.J.

Filed Nov. 24, 1965, Ser. No. 510,450
Int. Cl. C01b *21/52*
U.S. Cl. 23—203 R **6 Claims**

The method of imparting improved thermal stability to nitronium perchlorate crystals which comprises admixing water molecules in an attenuated form and in a proportion of about 0.1 to 3 weight percent with the crystals, giving the mixture sufficient time for migration of the water molecules and reaction with mixing at below 0° C., then removing reaction degradation products in gaseous state from the nitronium perchlorate reacted with the admixed water molecules under high vacuum down to about 1 to 8 mm. Hg. absolute pressure at room temperature.

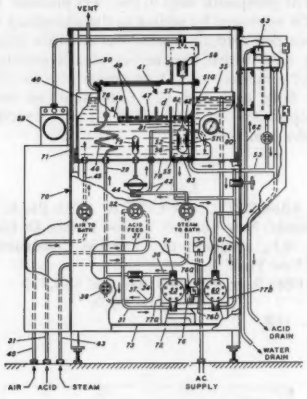
3,653,835

SPECIFIC GRAVITY ANALYZER FOR CONTROL OF AN ALKYLATION PROCESS

Albert John Brandel, Long Beach, Calif., assignor to Chevron Reasearch Company, San Francisco, Calif.

Division of Ser. No. 699,108, Jan. 19, 1968, Pat. No. 3,513,220.
Filed Oct. 20, 1969, Ser. No. 870,728
Int. Cl. G01n *9/18, 9/36;* **C07c** *3/14*
U.S. Cl. 23—230 R **7 Claims**

The acid strength of a process stream associated with an alkylation process using a mineral acid catalyst, such as sulfuric acid, can be conveniently and continuously measured by determining the specific gravity of a sample of acid taken from the main process stream. The sample is pumped under positive and fixed flow rates into and from an analysis chamber by means of first and second pumping means, connected, respectively, to the inlet and outlet of the chamber. Prior to determining the gravity of the acid within the chamber, dissolved volatile hydrocarbons and high molecular



weight, normally liquid, hydrocarbons are removed from the sample by stripping and settling chambers within the analysis chamber, the high molecular weight hydrocarbons flowing from the chamber by means of an overflow tube positioned in the settling chamber. The weight percent of the carbonaceous matter removed from the sample including the high molecular weight hydrocarbons is controlled by maintaining said second pumping means at a pumping rate less than that of said first pumping means.

3,653,836

REAGENT FOR DETERMINING BLOOD SUGAR

Wolfgang Gruber, Garatshausen nr. 16; Erich Bernt, 8000 Munich, Grunivalder Strasse 34; August Wilhelm Wahlefeld, Weilheim Andreus-Schmidtner Strasse 20; Werner Dollacker, 8000 Munich, Schopenhauerstrasse 61, all of Germany

Filed Aug. 26, 1970, Ser. No. 66,953
Claims priority, application Germany, Aug. 27, 1969, P 19 43 580.4
Int. Cl. G01n *21/06, 33/16*
U.S. Cl. 23—230 B **7 Claims**

A color-producing reagent for determining blood sugar comprising o-toluidine, thiourea, an ethylene glycol monolower alkyl ether, phthalic acid, and dimethyl formamide as a solubilizing agent, is outstandingly sensitive even to very low blood sugar contents, as in hypoglycaemia, and exhibits prolonged color stability.

3,653,837

GEOCHEMICAL EXPLORATION METHOD

Granville C. Egleson, Houston, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 16, 1970, Ser. No. 20,139
Int. Cl. G01m *15/00, 33/18;* **G01n** *33/24*
U.S. Cl. 23—230 EP **7 Claims**

The method of exploring for deposits of bittern salts such as sylvinite and carnallite which comprises collecting samples of formation, aqueous fluids and determining the concentrations of calcium, magnesium, or potassium and one or more of bromine and rubidium in said fluids. Parameter indicators include the individual concentrations of bromine and rubidi-

um and the concentration ratios of bromine to potassium, (magnesium plus calcium) to rubidium and (magnesium plus calcium) to bromine. Regressional correlations of these parameters indicate plan and profile directions to the desired salts.

3,653,838

METHOD FOR DETERMINING BASICITY OF USED OILS

John Richard Glass, Mickleton, N.J., assignor to Mobil Oil Corporation

Filed Feb. 9, 1970, Ser. No. 9,956
Int. Cl. G01n *31/16, 33/26, 31/22*
U.S. Cl. 23—230 HC **8 Claims**

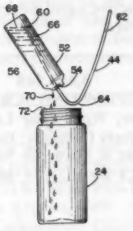
The total basicity of used engine oil is determined colorimetrically with a titrant comprising a strong acid in the presence of an indicator solution containing a non-aromatic hydrocarbon containing up to 10 carbon atoms.

3,653,839

FIELD TEST KIT REAGENT TRANSFERRING SYSTEM AND METHOD FOR USING SAME

Kraemer D. Luks, South Bend, Ind.; Evan Jones, Evanston, and Richard J. Krause, Addison, both of Ill., assignors to Henry Valve Company, Melrose Park, Ill.

Filed July 6, 1970, Ser. No. 52,424
Int. Cl. G01n *1/02, 21/02;* **F16b** *45/00*
U.S. Cl. 23—230 R **12 Claims**



Chemical analytical field test kits which include narrow mouthed vials or ampules for containing precisely measured quantities of reagent solutions are sometimes difficult to use. This is because of the difficulty in emptying, i.e., quantitatively transferring, the reagent solution from the narrow mouthed container. Some, or all of the solution tends to bridge the opening and "hang up" in the container. A suitable means for eliminating this difficulty is disclosed.

In a preferred embodiment, a test kit which utilizes a narrow mouthed glass vial also includes a short length of small diameter flexible tubing which is not substantially wetted by the reagent solution. Insertion of one end of the narrow diameter tubing into the opened analytical reagent vial, bending the other end of the flexible tubing back along the body of the vial, and pouring of the solution from the vial, while the tubing configuration remains fixed with respect to the vial, results in immediate delivery of all the reagent solution from the vial with substantially no risk of loss of drops of reagent solution, due to droplet scattering, or due to excess hold-up in the vial.

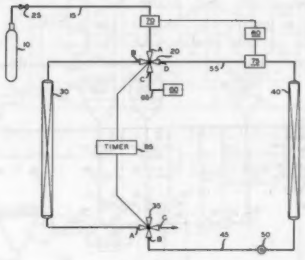
3,653,840

PORTABLE AIR POLLUTION DETECTOR

Robert S. Silas, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed June 5, 1969, Ser. No. 830,612
Int. Cl. B01k *3/00;* **G01n** *31/08*
U.S. Cl. 23—230 R **11 Claims**

Method and apparatus for rapidly and accurately testing, in a laboratory or preferably a field location, a sample, preferably a gasoline sample, to determine olefins having up to a predetermined number of carbon atoms therein by first chromatographically separating the olefins having up to one more carbon atom than said predetermined number from the remainder of the olefins, secondly time separating the olefins having up to said predetermined number of carbon atoms



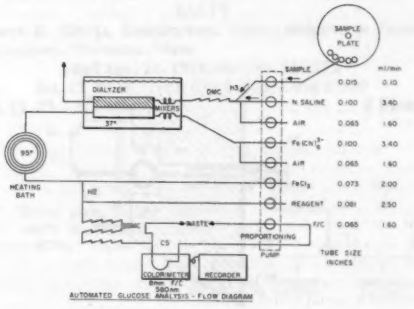
from the chromatographically separated stream by switching off the stream after the olefins having a predetermined number of carbon atoms, but before the olefins having one more carbon atom than said predetermined number pass through a detector, and finally detecting the presence of the olefins in the time separated stream by use of a suitable means such as a bromine coulometric titrator.

3,653,841

METHODS AND COMPOSITIONS FOR DETERMINING GLUCOSE IN BLOOD

Bernard Klein, New Hyde Park, N.Y., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Dec. 19, 1969, Ser. No. 886,538
Int. Cl. C09k *3/00;* **G01n** *31/22, 33/16*
U.S. Cl. 23—230 R **11 Claims**



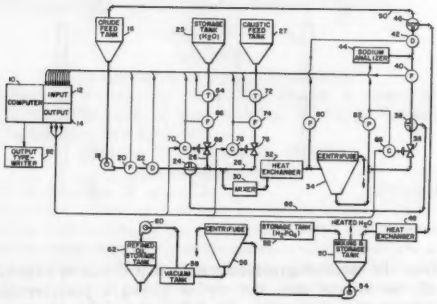
Colorimetric methods and compositions for quantitatively determining the glucose content of blood plasma or serum by heating a deproteinized sample of blood plasma or serum with an alkaline ferricyanide solution, followed by the addition of ferric ions and a 5-(2-pyridyl)-2H-1,4-benzodiazepine or water soluble salts thereof to produce a brilliant purple colored solution which can be quantitated by standard colorimetric means.

3,653,842

COMPUTER CONTROL SYSTEM FOR REFINING AND HYDROGENATION OF UNSATURATED HYDROCARBONS

Richard E. Putman, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 16, 1969, Ser. No. 885,405
Int. Cl. B01j *1/00*; C11b *3/06*; G01n *27/00*
U.S. Cl. 23—253 A 9 Claims



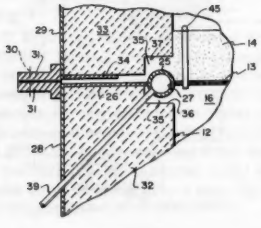
Described is a control system for a refining hydrogenation and deodorizing plant for edible oils and the like wherein various system variables are converted into signals which are fed to a computer which controls the system to optimize performance and reduce oil losses.

3,653,843

FLUIDIZED BED APPARATUS

John Marshall Seelander, Downers Grove, Ill., assignor to Copeland Systems Incorporated

Filed Sept. 29, 1970, Ser. No. 76,565
Int. Cl. B01j *2/16*
U.S. Cl. 23—284 8 Claims



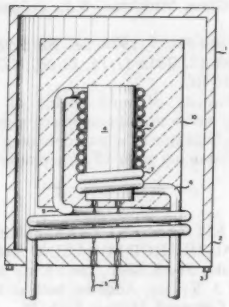
A fluidized bed apparatus comprising a particle bed supported in a container on an orifice plate and subjected to varying temperatures causing thermal expansion and contraction of the plate in combination with an elongated transversely yieldable tube attached to the plate at its periphery and at areas spaced from the plate to the container so that expansion and contraction of the plate due to the varying temperatures results in transverse yielding of the tube without substantial permanent distortion of the plate itself.

3,653,844

GAS PURIFICATION APPARATUS

Edwin K. Clardy, and Wilbur G. Ragains, both of Bartlesville, Okla., assignors to Philips Petroleum Company

Filed Feb. 2, 1970, Ser. No. 7,664
Int. Cl. B01d *53/34*; B01j *1/22*, *9/04*
U.S. Cl. 23—288 M 1 Claim



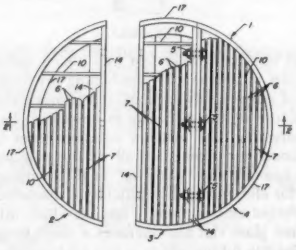
Apparatus is provided for purifying gaseous streams of contaminants, the apparatus being adapted to raise the gaseous stream to the necessary temperature and to pass the gas in contact with an active agent selected in view of the contaminant to be removed.

3,653,845

SELF-SUPPORTING SCREEN DECK

Terrence D. Moravec, White Bear Lake, Minn., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Oct. 6, 1969, Ser. No. 863,799
Int. Cl. B01d *23/18*; B01j *9/04*
U.S. Cl. 23—288 R 2 Claims



A self-supporting, segmented, slotted deck having at least two screen segments that can be attached to each other along a support beam. In its preferred form the screen segments are of slotted construction, with the slots increasing in cross-sectional area from the top side of the screen surface to the lower side.

3,653,846

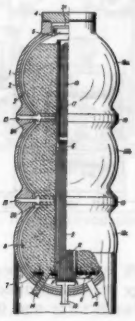
CONVERTER FOR HIGH PRESSURE SYNTHESIS

Jiri Kubec, Kunstat Na Morave, and Vladimir Saroch, Brno, both of Czechoslovakia, assignors to Kralovopolska Strojirna, Zavody chemickych zarizeni, narodni podnik, Brno, Czechoslovakia

Filed Aug. 5, 1969, Ser. No. 847,665
Int. Cl. B01j *9/04*, *3/00*
U.S. Cl. 23—289 4 Claims

A converter for high-pressure synthesis of ammonia or methanol having an upright outer pressure shell consisting of

three superimposed spherical segments and two interposed annular connectors, a thin-walled conforming liner in the shell, an upright conduit axially centered in the shell and extending from a grating in the lowermost segment close to a manhole atop the uppermost segment and barely big enough for insertion of the conduit therethrough. A body of particulate catalyst material fills the annular space between the liner



and the conduit from the grating almost to the top end of the conduit. A shell-and-tube heat exchanger is arranged in the conduit for preheating a portion of the gaseous reactants by means of the hot reaction gases. The remainder of the reactants is injected into the catalyst through perforated radial pipes extending from each connector toward the central conduit.

3,653,847

INHIBITION OF SODIUM BICARBONATE CRYSTALLIZATION DURING CRYSTALLIZATION OF OTHER MATERIALS USING POLYPHOSPHATES

Arthur E. Ableson, Los Angeles, Calif., assignor to American Potash & Chemical Corporation, Oklahoma City, Okla.

Continuation-in-part of application Ser. No. 727,709, May 8, 1968, now abandoned. This application Sept. 14, 1970, Ser. No. 72,136

Int. Cl. C01d *5/00*

U.S. Cl. 23—296 **10 Claims**

A process of separating a material consisting of at least one salt selected from the group consisting of sodium tetraborate and sodium sulfate from aqueous solutions containing the same and sodium bicarbonate. An alkali metal polyphosphate, such as sodium hexametaphosphate, is contacted with the aqueous solution to prevent the nucleation and crystallization of sodium bicarbonate while the material is crystallized from the solution and recovered. The sodium bicarbonate subsequently also may be recovered from the solution.

3,653,848

CRYSTALLIZATION PROCESS

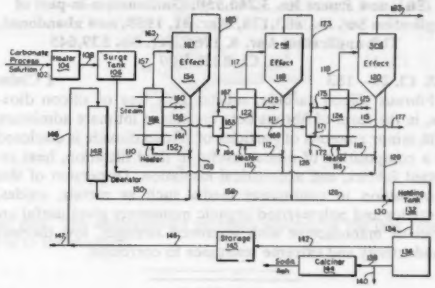
Eugene B. Port, Solvay, and Carlton J. Howard, Salina, both of N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Sept. 4, 1968, Ser. No. 757,511

Int. Cl. C01d *7/00, 11/00*

U.S. Cl. 23—302 **15 Claims**

Invention relates to the preparation of sodium carbonate precursor crystals, such as sodium bicarbonate, sodium sesquicarbonate, anhydrous sodium carbonate and sodium carbonate monohydrate by a crystallization process which involves forming a first crop of said precursor crystals from a substantially saturated carbonate process solution and subjecting the mother liquor separated from the first crop of precursor crystals to crystallization, including a crystallization temperature higher than that employed to obtain the



first crop of said precursor crystals, to effect formation of a second crop of precursor crystals.

3,653,849

COMPOUND $Pd_3P_2S_8$

Tom Allen Bither, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 12, 1969, Ser. No. 857,561

Int. Cl. C01b *25/00, 17/00;* **C01g** *55/00*

U.S. Cl. 23—315 **1 Claim**

The compound $Pd_3P_2S_8$ in the form of crystals having trigonal symmetry can be made by heating together the appropriate elements of binary compounds thereof providing the atomic ratio of S to P is greater than unity. The compound is useful as a semiconductor and as a catalyst for the replacement of aromatic hydrogen with carbonyl chloride groups.

3,653,850

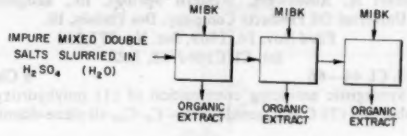
PROCESS FOR PURIFYING TANTALUM FLUORIDE SALTS

Robert E. Eberts, Framingham, Mass., assignor to Norton Company, Worcester, Mass.

Filed Apr. 14, 1969, Ser. No. 815,972

Int. Cl. B01d *11/02;* **C01d** *3/18;* **C01g** *35/00*

U.S. Cl. 23—312 ME **5 Claims**



Process for purifying tantalum fluoride double salts, e.g. K_2TaF_7, of other metallic impurities. By proper adjustment of an aqueous acid phase, the tantalum values of such relatively insoluble salts can be directly transferred to an organic extractant phase. Pure tantalum compounds can be recovered from the extract.

3,653,851

HIGH-STRENGTH METAL-SILICON CARBIDE ARTICLE

Bernard A. Gruber, Boxford, Mass., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of application Ser. No. 80,402, Jan. 3, 1961, now Patent No. 3,246,950, Continuation-in-part of application Ser. No. 803,176, Mar. 31, 1959, now abandoned. This application Apr. 4, 1966, Ser. No. 539,645
Int. Cl. B22f *5/00*
U.S. Cl. 29—183 1 Claim

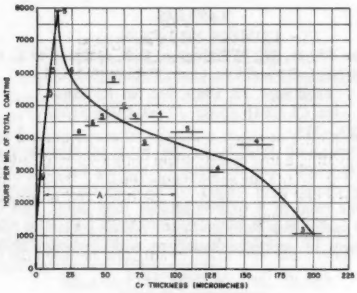
Fibrous silicon carbide, substantially free of silicon dioxide, in the form of fibrous beta crystals in intimate admixture with minor amounts of particles of silicon dioxide is disclosed as a composition of matter useful in fluid filtration, heat resistant fabrics, and accoustical insulation. Dispersion of this composition in continuous media such as metals, oxides, ceramics and polymerized organic monomers gives useful articles of manufacture with improved strength, low thermal conductivity and extreme resistance to corrosion.

3,653,852

COATED FERROUS SUBSTRATE

Bernard C. Seiler, Bethlehem, Pa., assignor to Bethlehem Steel Corporation

Filed Oct. 14, 1969, Ser. No. 866,290
Int. Cl. B32b *15/18, 15/20*
U.S. Cl. 29—196.6 4 Claims



A steel sheet has a composite coating thereon comprising a layer of chromium 5 to 100 microinches thick contiguous to the steel and a layer of aluminum 100 to 1,500 microinches thick contiguous to the layer of chromium. The chromium is deposited on the sheet while the steel is at a temperature within the range of 1,200° to 1,700° F.

3,653,853

SYNERGISTIC ANTI-ICING COMPOSITION

Robert H. Rosenwald, Western Springs, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Nov. 14, 1969, Ser. No. 877,011
Int. Cl. C10l *1/18, 1/22*
U.S. Cl. 44—66 8 Claims

Synergistic anti-icing composition of (1) polyhydroxy alcohol and (2) C_8–C_{20} amide of N—C_6–C_{20}-alkylene-diamine.

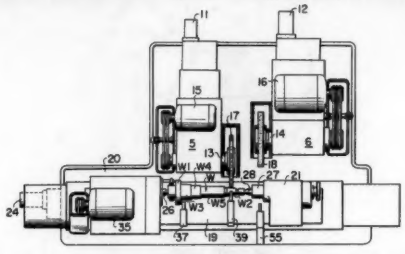
3,653,854

DIGITALLY CONTROLLED GRINDING MACHINES

Kiroaki Asano, Kariya, Japan, assignor to Toyoda Koki Kabushiki Kaisha, Aichi-ken, Japan

Filed Sept. 22, 1970, Ser. No. 74,315
Claims priority, application Japan, Sept. 29, 1969, 44/77652
Int. Cl. B24b *51/00*
U.S. Cl. 51—165 TP 7 Claims

In a digitally controlled grinding machine for working a workpiece including at least one cylindrical portion and at least one tapered portion, there are provided a first grinding wheel supported on a first grinding wheel carriage for working the cylindrical portion and a second grinding wheel supported on a second grinding wheel carriage for working the tapered portion. When the tapered portion of the workpiece



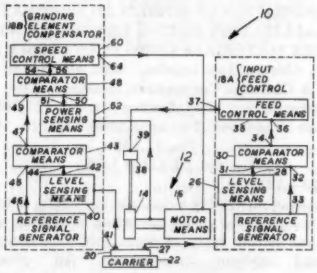
is to be ground, a work table for supporting the workpiece and the second carriage are fed in directions perpendicular with each other. The work table and the first and second grinding wheel carriage, are operated by servo-motors responsive to digital command signals prepared by informations stored in a memory.

3,653,855

GRINDING SYSTEM

Roderick L. Smith, 3920 Broadway, Rockford, Ill.

Filed May 23, 1969, Ser. No. 834,928
Int. Cl. B24b *49/04*
U.S. Cl. 51—165 TW 15 Claims



A grinding system comprising adjustable means for controlling the after grinding size of a work piece and production rate while maintaining surface integrity and finish of the work piece substantially constant.

3,653,856

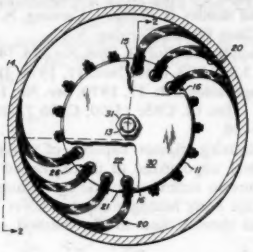
ROTARY ABRASIVE TOOL

Albert Field, c/o Field Abrasive Manf. Co., Inc., 1303 Stanley Avenue, Dayton, Ohio

Filed Mar. 20, 1970, Ser. No. 21,386
Int. Cl. B24d *13/04*
U.S. Cl. 51—334 4 Claims

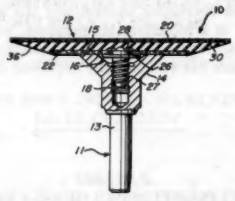
A plurality of pre-assembled abrasive units are removably mounted on the periphery of a cylindrical but, and each includes a pad of multiple abrasive-coated plies fastened together at their inner ends by an anchor clip formed for retention in slots in the hub. Each overlying ply is of successively shorter length, and the plies form at their outer ends multiple stepped abrading surfaces which define a self-dressing finishing surface for rotation against the work sur-

face. The plies are bowed into an arcuate shape and a predetermined flexibility to maximize the exposed finishing



surface and soften it for improved abrading and service life characteristics.

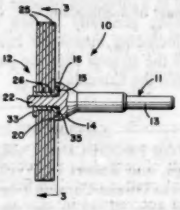
3,653,857
ABRADING IMPLEMENT
Albert Field, c/o Field Abrasive Manf. Co., Inc., 1303 Stanley Avenue, Dayton, Ohio
Filed Mar. 20, 1970, Ser. No. 21,358
Int. Cl. B24d *13/14*
U.S. Cl. 51—358 **7 Claims**



A unique abrasive disk unit includes a piece of vulcanizable rubber sandwiched between a single abrasive coated ply and a backing disk of fiber material. A stud or fitting is installed centrally within the backing disc and is adapted to be removably secured to a mandrel. The components are assembled in a mold, and the rubber is vulcanized by the application of heat and pressure to form an integral unit having strong flexural properties and a high resistance to deterioration from frictional heat.

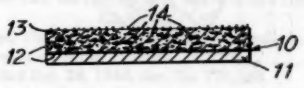
3,653,858
ABRADING IMPLEMENT
Albert Field, c/o Field Abrasive Manufacturing Co., Inc., 1303 Stanley Avenue, Dayton, Ohio
Filed Mar. 20, 1970, Ser. No. 21,387
Int. Cl. B24d *13/08, 13/14*
U.S. Cl. 51—378 **4 Claims**

A mandrel includes a driving shank with an integral working head at one end which supports a disk assembly. The working head has a flat axially extending face on an annular lip which is formed by a generally circular axial recess in the head, and a threaded stud extends axially outwardly from the recess to receive the disk assembly. The disk assembly includes a disk of multiple abrasive coated plies held together by an internally threaded grommet disposed centrally within the disk. The grommet has a flange on one end and, on the other end, rivet tabs which are turned over on the disk to hold the plies in superposed relation, and the tabs are small enough to fit within the recess in non-contacting relation with the working head to provide for positive head-to-disk engagement solely between the face and the bottom ply of



the disk. The arrangement prevents slipping of the disk relative to the mandrel.

3,653,859
ABRASIVE FOAM LAMINATE
William F. Zimmer, Jr., Paxton, Mass., and Harvey L. Chew, Latham, N.Y., assignors to Norton Company, Troy, N.Y.
Filed Dec. 4, 1969, Ser. No. 882,110
Int. Cl. B24d *11/00*
U.S. Cl. 51—401 **3 Claims**



A high density abrasive-containing foam product is made by impregnating a low density foam with a slurry of adhesive and abrasive, drying the same below the cure temperature of the adhesive and then laminating the dried and impregnated foam to a reinforcing backing by heat and pressure which both densifies the foam and effects the lamination using the abrasive binder adhesive to effect adhesion between the foam component and the backing component.

3,653,860
APPARATUS FOR PROCESSING A PLURALITY OF STRAND-LIKE MATERIALS
Roy E. Smith, Toledo, and John W. Dunn, Sylvania, both of Ohio, assignors to Owens-Corning Fiberglas Corporation
Filed May 25, 1970, Ser. No. 40,027
Int. Cl. C03b *37/02*
U.S. Cl. 65—11 W **10 Claims**

Apparatus for processing a plurality of strands including means for supplying a group of side-by-side strands along

given paths and a member having side-by-side extensions projecting in nonintersecting relationship with the group of strands where the extremities of the extensions have guide surfaces oriented in a direction oblique to the axes of the extensions and facing generally toward the group. The apparatus further including means for moving the member to engage and move the strands over the guide surfaces and into the spaces between the extensions.

3,653,861

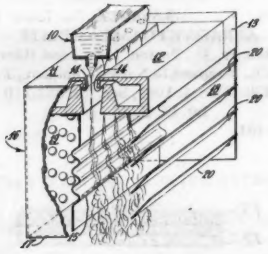
APPARATUS FOR PRODUCING CURLY GLASS FIBERS

Charles J. Stalego, and Robert E. Wyckoff, both of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation

Filed Aug. 27, 1970, Ser. No. 67,442

Int. Cl. C03b *37/06*

U.S. Cl. 65—16 **12 Claims**



An apparatus for producing curly fibers from a molten stream which is pulled from a melt by high velocity attenuating fluid. The device includes a fiber forming feeder having orifices extending between a pair of elongate blowers which direct intersecting streams of high pressure fluid below the orifices to attenuate and cool the molten streams into fibers. Positioned below the orifices is a single skirt extending generally parallel to the direction of movement of the fibers and having a plurality of sinuous convolutions. High velocity air streams pulling the plastic fibers across the convolutions cause them to impinge against one or more skirt convolutions and to assume a curvilinear configuration prior to losing plasticity and leaving the skirt area. The skirt may be surrounded by a peripheral housing having air vents which permit the lateral entry of outside air pressure to further assure contact between the skirt and descending fibers.

3,653,862

GLASS CERAMIC BODIES, AND METHOD BY BORIC OXIDE TREATMENT

Charles S. Lynch, Toledo, Ohio, assignor to Owens-Illinois, Inc.

Continuation of application Ser. No. 583,410, Sept. 30, 1966, now abandoned. This application Jan. 13, 1970, Ser. No. 1,990

Int. Cl. C03b *29/00*; C03c *15/00*

U.S. Cl. 65—30 **4 Claims**

A method of making a strong, high expansion ceramic body resulting from thermal crystallization of an alumino-silicate glass body wherein the body is contacted with boric oxide vapors at a temperature above 1400° F. for at least 10 minutes until the boric oxide vapors have reacted with the surface layer of the body to form an integral surface layer of borosilicate glass on the body. Upon cooling, a compressive stress forms in the vitreous layer. The lineal coefficient of thermal expansion of the ceramic body is at least 50×10^{-7}/°C over the range 0° to 300° C.

3,653,863

METHOD OF FORMING PHOTOCHROMIC POLARIZING GLASSES

Roger J. Araujo, Corning, N.Y.; William H. Cramer, Yakima, Wash., and Stanley D. Stookey, Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Original application July 3, 1968, Ser. No. 742,151, now Patent No. 3,540,793, dated Nov. 17, 1970. Divided and this application Feb. 17, 1970, Ser. No. 14,856

Int. Cl. C03c *15/00*; C03b *21/00*

U.S. Cl. 65—30 **4 Claims**

Light polarizing glasses capable of reversible changing from the clear unpolarized to the darkened polarized state upon exposure to actinic radiation said glasses comprised of a silicate glass body having elongated silver halide particles incorporated therein, and to the method of making such glasses.

3,653,864

DEALKALIZATION OF GLASS SURFACES

Daphne L. Rothermel, and Stanley D. Stookey, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 17, 1969, Ser. No. 807,984

Int. Cl. C03c *15/00*

U.S. Cl. 65—30 **4 Claims**

This invention relates to the improvement in surface durability of alkali metal oxide containing glasses through the removal of the alkali metal oxide by a treatment which comprises hydrating the alkali metal oxide containing glass in an autoclave, and thereafter dealkalizing the glass surface by contacting it, at a moderate temperature, with a non-acidic non-aqueous solvent having a high dielectric constant. The resultant surface has substantially improved chemical surface durability.

3,653,865

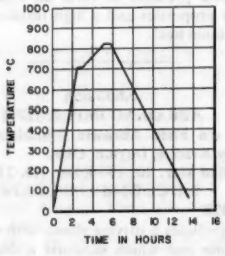
NEPHELINE-FELDSPAR GLASS-CERAMICS

John E. Megles, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed June 2, 1970, Ser. No. 42,838

Int. Cl. C03b *29/00*

U.S. Cl. 65—33 **6 Claims**



An improved method for the manufacture of fine-grained glass-ceramic articles wherein the crystal phase consists essentially of nepheline with, optionally, a minor amount of feldspar characterized by high mechanical strength and being useful for many consumer ware and technical applications.

3,653,866

METHOD OF PRODUCING TOUGHENED GLASS

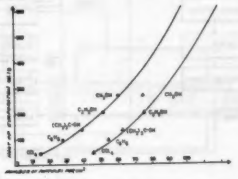
Erwin W. Wartenberg, Brunnwiessen 6, Stuttgart, Germany

Continuation-in-part of application Ser. No. 692,778, Dec. 12, 1967, now abandoned. This application Sept. 23, 1970, Ser. No. 74,897

Claims priority, application Germany, Dec. 28, 1966, W 43078

Int. Cl. C03b 27/00

U.S. Cl. 65—116 30 Claims



Glass is toughened by quenching the hot glass in a bath which consists essentially of a major proportion of a carrying liquid which is inert relative to the glass and has a boiling point below the temperature of the hot glass which is to be quenched and of a minor proportion of a liquid having a boiling point at least 100° C. below the boiling point of the above mentioned carrying liquid. Thereby the speed of quenching the glass is greatly increased.

3,653,867

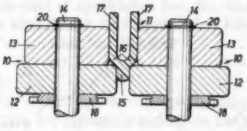
DEVICE FOR UNITING THE EDGES OF A DOUBLE OR MULTIPLE GLASS PANE

Eduard Bayer, Hugo-Wolf-Str. 12B, Salzburg, Gneis, Austria, and Willi Vogelbruch, In der Stufke 11, Sprockhovel, Germany

Filed June 1, 1970, Ser. No. 41,929

Int. Cl. C03b 23/24

U.S. Cl. 65—156 8 Claims



A device for uniting the edges of double or multiple glass panes in which the squeezing rollers engaging the edges of the glass panes comprise each two individual rollers which are independently rotatable. One pair of said individual rollers of the squeezing rollers engage opposite edges of said glass panes to be united and are spaced apart a distance equal to the thickness of the edge to be formed by the squeezing operation on the united glass panes. The other pair of said individual rollers of said squeezing rollers engage opposite faces of said two glass panes to be united adjacent said squeezed edges, and are spaced from each other a distance which is substantially equal to the thickness of the completed multiple glass pane.

3,653,868

WATER FENCE SUPPORT IN FLOAT GLASS APPARATUS

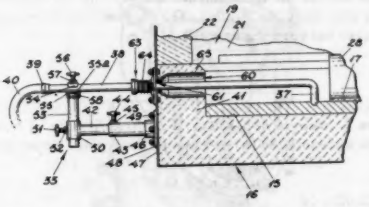
Francis L. Swillinger, Perrysburg, Ohio, assignor to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Feb. 25, 1970, Ser. No. 14,001

Int. Cl. C03b 18/02

U.S. Cl. 65—182 R 4 Claims

A device for externally supporting the outer end of a pivotally mounted water fence in a float glass apparatus so as to provide three dimensional adjustment of the operating portion of the fence. An outwardly extending telescoping member is secured to the tank structure to provide support and axial or in and out adjustment. A vertical telescoping member secured to the outboard end thereof permits the



fence to pivot vertically about the entry point through the bath side wall. The outer end of the fence is clamped between spaced horizontal members atop the vertical telescoping member in a manner which provides for adjustment therealong to accomplish horizontal pivotal adjustment of the fence.

3,653,869

APPARATUS FOR SKIMMING THE SURFACE OF MOLTEN METAL BATHS IN THE MANUFACTURE OF GLASS

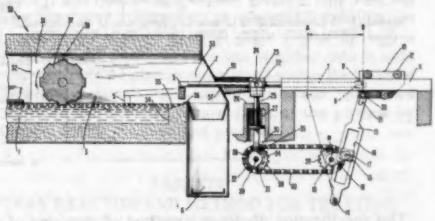
Silvano Biagini, Pisa, Italy, assignor to Compagnie de Saint-Gobain, Neuilly sur Seine, France

Filed Oct. 24, 1968, Ser. No. 770,360

Claims priority, application France, Oct. 24, 1967, 125643

Int. Cl. C03b 18/02

U.S. Cl. 65—182 R 3 Claims



Apparatus is provided for removing slag from the surface of a metal bath, for instance molten metal employed in the manufacture of glass by the flotation process, in which bays are provided in the wall of the tank along the course of the glass, the surface liquid, including floating slag, is drawn into the bays, is cleaned by skimming, and returned to the main tank. Novel mechanism if provided to control the motion of the skimmers.

3,653,870

HOLDING AND COOLING DEVICE FOR GLASSWARE MOLDS

Thomas V. Foster, Oberengstringen, and Herman H. Nebelung, Binz-Maur, both of Switzerland, assignors to Emhart Corporation, Bloomfield, Conn.

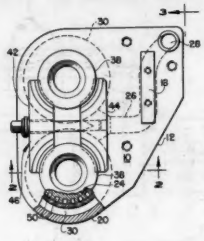
Filed Mar. 9, 1970, Ser. No. 17,562

Int. Cl. C03b 9/38

U.S. Cl. 65—356 8 Claims

A holding and cooling device for glassware molds, particularly for one-piece inverted parison body molds for wide mouth ware. The holder has an internal passage for cooling air, a portion of which passage surrounds the associated mold

or molds, and ports from the passage are directed to the molds which have vertical ribs and interspersed flutes. The molds are rotatably adjustably positioned in vertical openings



in the holder, and such adjustment positions the ribs to close off selected ports while leaving the remaining ports open for the flow of cooling air into the flutes on the mold.

3,653,871

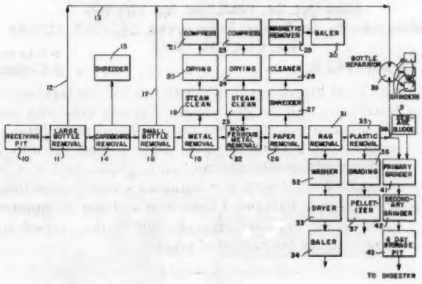
METHOD OF DISPOSING AND RECLAIMING SOLID REFUSE

Andre Tempe, P.O. Box 242, Budd Lake, N.J.

Filed Aug. 4, 1970, Ser. No. 60,856

Int. Cl. C05f *11/08, 9/00*

U.S. Cl. 71—8 **13 Claims**



This specification discloses a method of disposing of solid refuse and converting it into usable end products. Two basic groups of method steps are involved. One is the sorting of the refuse to segregate metals, cardboard, cartons and papers; bottles and glass; cloth and rags; and plastics, together with attending steps of treating the sorted components to reclaim them for usage. The second group of steps is the processing of the organic materials which remain after the above solids have been removed to convert it into usable organic fertilizer.

3,653,872

PROCESS FOR THE PREPARATION OF A NITROPHOSPHATE FERTILIZER

Arieh Y. Guery, Rijswijk, Netherlands, assignor to Badger N.V., The Hague, Netherlands

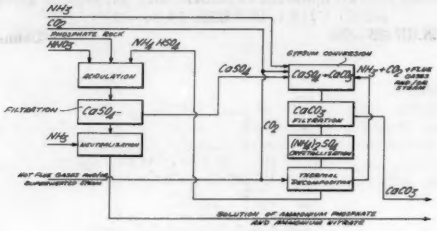
Filed Dec. 5, 1969, Ser. No. 882,603

Claims priority, application Netherlands, Dec. 18, 1968, 68/18164

Int. Cl. C05b *11/06*

U.S. Cl. 71—35 **2 Claims**

A process for the preparation of nitrophosphate fertilizer by acidulation of phosphate rock by means of a mixture of HNO_3 and NH_4HSO_4, wherein the NH_4HSO_4, serves for the acidulation as well as for the precipitation of the calcium present in the phosphate rock as $CaSO_4.2H_2O$. The latter is treated with a gas mixture containing NH_3 and CO_2, forming



$CaCO_3$ and $(NH_4)_2SO_4$. The $(NH_4)_2SO_4$ is thermally decomposed to form NH_4HSO_4, which is recycled to the acidulation reaction. The acidulated phosphate rock solution is neutralized with NH_3 to obtain the nitrophosphate fertilizer.

3,653,873

ETHYLENIC SULFILIMINE COMPOSITIONS FOR CONTROLLING FUNGI, BACTERIA AND ALGAE

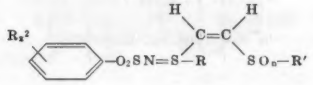
Horst O. Bayer, Levittown, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Original application Feb. 16, 1968, Ser. No. 705,916, now Patent No. 3,542,865, dated Nov. 24, 1970. Divided and this application Feb. 17, 1970, Ser. No. 12,149

Int. Cl. A01n *9/16*

U.S. Cl. 71—67 **9 Claims**

The use of selectively oxidized ethylenic sulfilimines of the formula



to protect agricultural, organic, and related articles from attack by noxious living organisms, such as fungi, bacteria and algae.

3,653,874

PRODUCTION OF METAL PELLETS FROM METALLIC OXIDES

Elwood V. Schulte, Pittsburgh, Pa., assignor to Koppers Company, Inc.

Filed Jan. 2, 1970, Ser. No. 246

Int. Cl. C21b *1/24*

U.S. Cl. 75—3 **10 Claims**

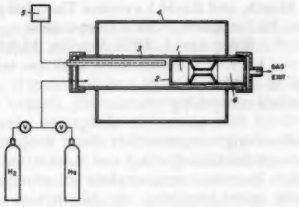
A process and apparatus for producing pellets of iron from finely divided iron oxide materials is provided in which the process includes: (1) admixing the finely divided iron oxide materials with alkaline earth metal oxides or hydroxides; (2) forming pellets of the admixture; (3) simultaneously drying and carbonating the pellets; and, (4) reducing the iron oxide materials to iron. Moreover, to produce steel from the finely divided iron oxide materials, the reduced pellets are immediately charged into a conventional steelmaking furnace.

3,653,875

RECOVERY OF METALS AND PHOSPHATE FROM WASTE PHOSPHATE SLUDGE

Roy F. Waters; Howard E. Powell, and Lee N. Ballard, all of Rolla, Mo., assignors to The United States of America as represented by the Secretary of the Interior

Filed Mar. 2, 1971, Ser. No. 120,235
Int. Cl. C21b 15/00; C01b 25/00; C21b 1/00
U.S. Cl. 75—21 6 Claims



Waste phosphate sludge containing metals including iron and zinc are mixed with an alkali solution, and the mixture is dried and sintered at a temperature of about 500° to 1300° C. in the presence of a reductant, which may be either a reducing gas or a solid reductant. This results in conversion of the phosphate to a water-soluble salt, reduction of zinc to the metallic state and volatilization of the zinc from the reaction zone, and reduction of iron and other metallic elements to the metallic state. Leaching of the sinter cake with water recovers the soluble phosphate and frees the reduced metals for recovery in the form of fine-grained iron or iron alloy powder.

3,653,876

FERROUS PELLETS

Fritz O. Wienert, 394 Roosevelt Avenue, Niagara Falls, N.Y.

Continuation-in-part of application Ser. No. 464,545, June 16, 1965, now abandoned. This application July 11, 1968, Ser. No. 743,932
Int. Cl. C21b 1/08
U.S. Cl. 75—28 9 Claims

The production of ferrous metallurgical pellets containing sufficient reductant for complete reduction has been accompanied by problems, because the pellets tend to crumble at temperatures in the range of 300°–800° C. This loss of hot crushing strength is suggested herein to be due to the reduction of iron oxide from the trivalent to the divalent state. In accordance with this invention, the reductant is subjected to a controlled oxidation which removes the most active carbon, preventing significant reduction at temperatures below about 900° C. and which preserves the hot crushing strength. Oxidation of the reductant can be carried out before or after pellet formation.

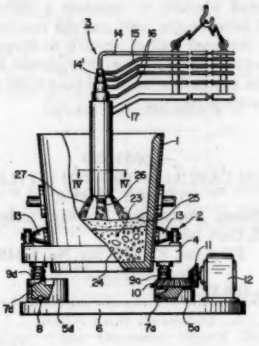
3,653,877

METHOD OF MAKING MOLTEN METAL FOR CASTING

Ryosuke Enya, No. 3620 Shinichi, Murozumi-cho, Hikari, Japan

Filed Mar. 6, 1970, Ser. No. 17,151
Claims priority, application Japan, Sept. 11, 1969, 44/71624
Int. Cl. C21b 11/00; C21c 5/56; C22c 1/02
U.S. Cl. 75—43 14 Claims

A method for making molten metal for casting directly from cold starting material. Cold starting material is placed in a movable vessel, and a layer of particulate material selected from the group consisting of coke and flux is spread on the top of the starting material in the vessel. One or more flames of hydrocarbon fuel-oxygen mixture are directed to the particulate layer, while translating the vessel along a closed path, so as to heat the particulate to white-hot state and to mix the cold starting material with the particulate thus heated, for melting the starting material. A composition-control agent is added in the material thus melted for producing



desired composition of molten metal, while maintaining the flames and the translation. A fluid curtain is formed around the flames to inhibit the flames from directly burning the inner surface of the vessel.

3,653,878

COLD AND HOT ROLLING PROCESS OF SCRAP CARS FOR PRODUCING A COMPACT STEEL MASS

Yo Jonghe, No. 18, 3-chome Nanyodori, Nagoya, Japan

Filed July 16, 1969, Ser. No. 842,153
Int. Cl. C21b 7/00; B21d 5/08
U.S. Cl. 75—63 6 Claims

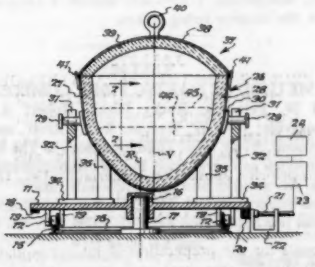
A cold and hot rolling process of scrap cars for producing a compact steel briquet as a raw material for the steel-making industry, wherein scrap cars are forcibly cold and hot rolled by successive rollers into an elongated steel briquet which consists of a sheet of steel plate folded up into a number of upright pleats and molten together into a unit, while the width of said plate is maintained within the width of the rollers and materials other than iron and steel contained or attached to the cars are removed out of the process by melting them during the course of process.

3,653,879

ROTARY REACTOR AND METHOD FOR TREATING MELTS

Fritz O. Wienert, 394 Roosevelt Avenue, Lewiston, N.Y.

Continuation-in-part of application Ser. No. 502,644, Oct. 22, 1965, now abandoned. This application Oct. 14, 1969, Ser. No. 866,354
Int. Cl. C22b 9/00; C21c 7/00
U.S. Cl. 75—93 R 18 Claims



Mixing of melts and one or more reagents is carried out in an upright rotary reactor mounted for rotation about an

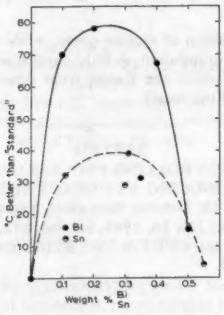
upright axis that passes through the reactor but is not concentric with the vertical axis of the reactor. A major portion of the reaction is carried out while the reactor is rotated about the upright axis in one direction or the other at slowly changing speed whereby to maintain a difference in rotational speed between the melt and the reactor. The reactor has a lining, the inner wall of which is so shaped that at least a part thereof is adapted to divert the portion of a melt in the reactor which is adjacent the inner wall from a circular path when the reactor is rotated.

3,653,880

MAGNESIUM CAST ALLOYS WITH LITTLE TENDENCY TO HOT-CRACK

Gunnar Gitlesen, Porsgrunn, Norway, assignor to Norsk Hydro A/S, Oslo, Norway

Filed Jan. 8, 1970, Ser. No. 1,449
Int. Cl. C22c *23/00*
U.S. Cl. 75—168 C **4 Claims**



Magnesium cast alloys containing 3–10 percent aluminum, 0.3–2 percent zinc and 0.1–0.4 percent bismuth or tin, all by weight, showing little tendency to hot-crack.

3,653,881

ALLOY FOR USE IN SPARK PLUG ELECTRODES

David M. McCann, and John Hrinevich, Jr., both of Flint, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 3, 1970, Ser. No. 60,758
Int. Cl. C22c *19/00*
U.S. Cl. 75—171 **2 Claims**

Alloys adapted for use in spark plug electrodes, the alloy being so constituted as to retain a low electrical resistivity while possessing a high degree of resistance to oxidation and corrosion. The alloy consists essentially of the following constituents on a weight percent basis, chromium 2.0–2.5, iron 3.0–3.5, manganese 1.75–2.25, silicon 1.75–2.25, titanium 0.2–0.4, the balance being nickel.

3,653,882

METHOD OF MAKING FIBER COMPOSITES

Donald W. Petrasek, Rocky River; Robert A. Signorelli, Strongsville; John W. Weeton, Rocky River, and Gerald B. Beremand, Avon, all of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Original application Oct. 18, 1968, Ser. No. 768,907. Divided and this application Feb. 27, 1970, Ser. No. 15,222
Int. Cl. B22f *3/14*
U.S. Cl. 75—208 **8 Claims**

A method of making a fiber composite having high strength at 2000° to 2200° F. by slip casting a nickel alloy matrix slurry into an array of tungsten fibers. The slip is dried and sintered in dry hydrogen at 1500° F. for one hour. The resulting body is isostatically hot pressed at 20,000 p.s.i. and 1500° F. for one hour, followed by a second isostatic hot pressing at 2000° F. for 1 hour.

3,653,883

METHOD OF FABRICATING A POROUS TUNGSTEN BODY FOR A DISPENSER CATHODE

Alfred Month, and David Lawrence Thornburg, both of Lancaster, Pa., assignors to RCA Corporation

Filed Apr. 1, 1970, Ser. No. 24,830
Int. Cl. B22f *1/00*
U.S. Cl. 75—212 **6 Claims**

A method comprising

A. dissolving tungsten trioxide or molybdenum trioxide in a solvent containing water and at least one of morpholine, ethylene diamine, tetraethylene pentamine, triethylene tetramine, triethanolamine, hexamethylene tetramine, and glycine to produce a solution,

B. mixing tungsten metal powder with a quantity of said solution to provide in addition about 0.25 to 4.00 weight percent tungsten or molybdenum as a compound thereof in said mixture,

C. pressing a quantity of said mixture into a pellet,

D. and then heating said pressed pellet above 2,000° C. to produce a porous tungsten body.

3,653,884

PROCESS FOR THE CONTINUOUS PRODUCTION OF A STRIP FROM POWDERED METAL

Idwal Davies, Killay, Swansea, and Alan G. Harris, Tycoch, Swansea, both of Wales, assignors to The British Iron and Steel Research Association, London, England

Filed Mar. 13, 1969, Ser. No. 807,101
Claims priority, application Great Britain, Mar. 14, 1968, 12,484/68
Int. Cl. B22f *1/00*
U.S. Cl. 75—214 **7 Claims**

A process is provided for rolling metal strip, particularly iron or iron alloy strip, directly from powdered metal using a technique in which a self-supporting metal powder/binder strip is formed from a slurry containing the metal and binder composition, together with a hygroscopic substance on a support surface and the resultant strip is compacted by rolling and then sintered. Typical hygroscopic substances are polyhydroxy compounds such as glycerol and polyalkylene glycols and their use is found to improve the mechanical properties of the final strip.

3,653,885

PROCESS OF STABILIZING A MIGRATION IMAGE COMPRISING SELENIUM PARTICLES

Mortimer Levy, Rochester, and Peter P. Augostini, Webster, both of N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Continuation-in-part of application Ser. No. 590,959, Oct. 31, 1966, now abandoned. This application Apr. 20, 1970, Ser. No. 29,932
Int. Cl. G03g *13/22*
U.S. Cl. 96—1 R **12 Claims**

An image comprising migration material residing on a metallic conductive substrate and formed in accordance with the migration imaging process is stabilized and fixed onto the substrate by heating the substrate and the migration material to produce a chemical reaction therebetween resulting in a permanent stable image having high density and resolution.

3,653,886

PREPARATION OF PRINTING FORMS BY THE IONIC POLYMERIZATION OF PHOTOCONDUCTORS

Erwin Lind, Auringen Uber Wiesbaden, and Wolfgang Wiedemann, Niederwalluf, Rhineland, both of Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

Filed Apr. 10, 1968, Ser. No. 720,383
Claims priority, application Germany, Apr. 13, 1967, K 62004
Int. Cl. G03g ; G03c *5/00*
U.S. Cl. 96—1 R **6 Claims**

This invention relates to an electrophotographic reproduction process for the preparation of printing plates from electrophotographic reproduction material in which a latent electrostatic image is produced on a layer containing at least one polymerizable organic photoconductor having olefinic double bonds therein, or capable of forming such bonds during heating, the image is made visible by means of a developer which comprises at least one fnely-divided substance which acts as a catalyst for the ionic polymerization of olefins, the reproduction material with the developed image thereon is heated to a temperature between about 50° and 300° C., and the organic photoconductor layer then is removed in a conventional manner from the non-image areas by dissolving it away.

3,653,887

NOVEL α,α'-BIS(AMINOBENZYLIDENE) ARYLDIACETONITRILE PHOTOCONDUCTORS

Stewart H. Merrill, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 4, 1969, Ser. No. 874,016
Int. Cl. G03g *5/06*
U.S. Cl. 96—1 PC **6 Claims**

α,α'-bis(aminobenzylidene)arylidacetonitriles are useful as organic photoconductors in electrophotographic elements. Elements containing these materials exhibit improved speeds.

3,653,888

THERMOPLASTIC RECORDING

Gerhard Lessman, Evanston, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed May 19, 1960, Ser. No. 30,291
Int. Cl. G03g *13/22;* **B41m** *5/20*
U.S. Cl. 96—1.1 **19 Claims**

The disclosure relates to a process and apparatus for recording information on a dielectric thermoplastic material in the form of a ripple pattern. A layer of dielectric photoconductive material may be used to form an electrostatic latent image, which is transferred to the thermoplastic material to control the deformation of the thermoplastic material in image configuration.

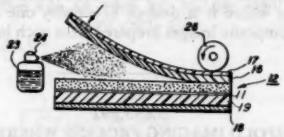
3,653,889

METHOD OF FIXING MANIFOLD IMAGES

Ray H. Luebbe, Jr., Rochester, N.Y., and John F. Byrne, Worthington, Ohio, assignors to Xerox Corporation, Rochester, N.Y.

Filed July 28, 1969, Ser. No. 845,343
Int. Cl. G03g *13/22*
U.S. Cl. 96—1 **11 Claims**

This invention pertains to an imaging system wherein there is employed a structure comprising a cohesively weak electrically photosensitive imaging layer sandwiched between a donor sheet and a receiver sheet. Images are produced by rendering the imaging layer cohesively weak by treatment with an activator and while subjecting the imaging layer to an electric field, it is exposed to electromagnetic radiation to which it is sensitive. With the field still applied, the sandwich is separated whereby the imaging layers fractures with the exposed portion of the imaging layer residing on one of the sheets and the unexposed portion residing on the other sheet. Images of superior quality are provided by inserting between the donor sheet and the imaging layer a solvent softenable



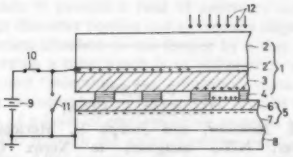
layer which acts as a fixative for the image produced. Such images, when formed on transparent donor sheets, are particularly useful as transparencies which project a bright color image.

3,653,890

SCREEN ELECTROPHOTOGRAPHIC CHARGE INDUCTION PROCESS

Ryubun Selmiya; Yuzo Ohmuro; Sigeru Hanaoka, and Masaru Nakamura, all of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd.

Filed Oct. 21, 1968, Ser. No. 769,255
Claims priority, application Japan, Oct. 25, 1967, 43/68413; June 26, 1968, 43/43866; July 3, 1968, 43/45875; July 24, 1968, 43/51821
Int. Cl. G03g *13/22*
U.S. Cl. 96—1 R **11 Claims**



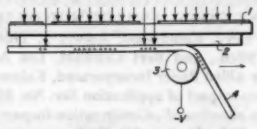
A charge induction electrophotographic imaging process wherein an insulating mesh is interposed between the photosensitive layer and the final record member.

3,653,891

FORMS OVERLAY TECHNIQUE USING TESI

Thomas L. Thourson, Penfield, and Oscar G. Hauser, Rochester, both of N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed Dec. 31, 1969, Ser. No. 889,430
Int. Cl. G03g *13/22*
U.S. Cl. 96—1 **6 Claims**



A method of forming composite electrostatic latent images in one mode from both positive and negative optical information is disclosed. The techniques employed to form positive electrostatic images from optically positive information and optically negative information involve the use of principles relating to breakdown of air in a gap under the influence of a field. By properly controlling the polarity of the applied field any optical input may be used to deposit a positive electrostatic latent image on a suitable receiver to provide a com-

posite image. This method of forming a composite image from optically positive and negative information may be used in a forms overlay fashion where it is desired to have ready access to certain forms for printout with information complimentary thereto or in any other electrophotographic image application where it is desired to employ one developer to develop composite images prepared from such information.

3,653,892

MANIFOLD IMAGING PROCESS WHEREIN THE IMAGED ELEMENTS MAY BE RECOMBINED AND REUSED

Robert W. Gundlach, Victor, and John B. Wells, Rochester, both of N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed July 1, 1969, Ser. No. 838,193
Int. Cl. G03g *13/22*
U.S. Cl. 96—1.3 **20 Claims**

An imaging process wherein a reusable imaging layer comprising a cohesively weak electrically photosensitive imaging material is sandwiched between a donor sheet and a receiver sheet, subjected to an electric field and exposed to an imagewise pattern of electromagnetic radiation to which it is sensitive. The donor and receiver sheets are then separated thereby fracturing the imaging layer in imagewise configuration. The imaging layer is rendered reusable by recombining the sandwich, subjecting it to an electric field opposite in polarity to the first electric field while flood exposing the imaging layer to electromagnetic radiation to which it is sensitive.

3,653,893

IMAGING SYSTEM

Burton B. Jacknow, and Joseph H. Moriconi, both of Rochester, N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Original application June 5, 1967, Ser. No. 643,394, now Patent No. 3,577,345. Divided and this application Aug. 28, 1970, Ser. No. 68,019
Int. Cl. G03g *13/08*
U.S. Cl. 96—1.4 **5 Claims**

A finely-divided low melting toner comprising a colorant, a thermoplastic resin comprising a vinyl resin, a solid metal salt of a fatty acid, and a solid additive having a melting point between about 115° F. to about 270° F. comprising a benzoate, a sulphonamide or a polychlorinated polyphenyl compound.

3,653,894

ELECTROCONDUCTIVE PAPER, ELECTROGRAPHIC RECORDING PAPER, AND METHOD OF MAKING SAME

Robert M. Levy, Kalamazoo; Robert J. Thiessen, Richland, both of Mich., and Bert Growald, Los Altos, Calif., assignors to Allied Paper Incorporated, Kalamazoo, Mich.

Continuation-in-part of application Ser. No. 565,685, July 18, 1966, now abandoned , Continuation-in-part of application Ser. No. 565,686, July 18, 1966, now abandoned. This application Dec. 11, 1969, Ser. No. 884,307
Int. Cl. G03g *7/00;* **C08c** *17/16;* **C09d** *5/24*
U.S. Cl. 96—1.7 **20 Claims**

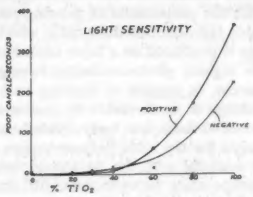
Electroconductive paper utilizing montmorillonite clay in a binder as the conductive agent is disclosed. The electroconductive paper can be overcoated with a dielectric film or a coating of a photoconductor in a non-conductive or dielectric binder for an electrostatic printing purpose. When the montmorillonite clay is in a non-water-sensitive binder such as a latex binder, an aqueous coating of photoconductive material can be used.

3,653,895

REPRODUCTION UTILIZING A BICHARGEABLE PHOTOCONDUCTIVE LAYER CONTAINING ZINC OXIDE AND TITANIUM DIOXIDE

Richard L. Brandon, Vancouver, Wash., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Mar. 11, 1970, Ser. No. 18,480
Int. Cl. G03g *5/00*
U.S. Cl. 96—1 PC **4 Claims**



An electrophotographic recording sheet having a bichargeable photoconductive layer extending over a sheet substrate including as photoconductive pigments in the layer a blend of photoconductive zinc oxide and photoconductive titanium dioxide, the titanium dioxide comprising from 20 to 70 percent of such blend and the zinc oxide comprising at least 20 percent of the blend. These impart to the sheet a positive and a negative charge acceptance exceeding 350 volts, and a positive and a negative light sensitivity value of less than 120 footcandle-seconds.

3,653,896

DIFFUSION TRANSFER FILM UNIT

Paul H. Stewart, and David W. Fay, Administrator, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y., by said Paul H. Stewart

Filed Nov. 3, 1970, Ser. No. 86,593
Int. Cl. G03c *5/54, 1/58, 1/48*
U.S. Cl. 96—3 **27 Claims**

Photographic elements and film units are disclosed comprising a silver halide emulsion having associated therewith a quinone-coupling dye capable of forming a diffusible methylene base in alkaline processing composition. A diffusible dye is produced imagewise which diffuses to a dye image-receiving layer to provide a positive dye image. The diffusible dye is immobilized in the developed areas of the negative by reacting with an oxidized hydroquinone or catechol developing agent. The dye image-receiving layer may be located integral with the photo-sensitive element or may be located on a separate support adapted to be superposed on the photosensitive element after exposure thereof.

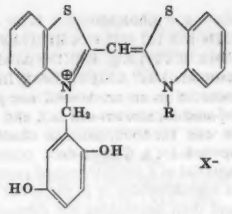
3,653,897

YELLOW DYE DEVELOPERS AND TRANSFER SYSTEMS EMPLOYING SAME

Derek D. Chapman, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 23, 1970, Ser. No. 92,272
Int. Cl. G03c *7/00, 5/54, 1/48*
U.S. Cl. 96—3 **18 Claims**

Substituted 3-(dihydroxybenzyl)thiacyanine yellow dye developers having the general formula:



wherein R represents a hydrogen atom, an alkyl group or an aryl group and X represents an acid anion, provide improved dye hue and reduced color contamination in diffusion transfer systems.

3,653,898

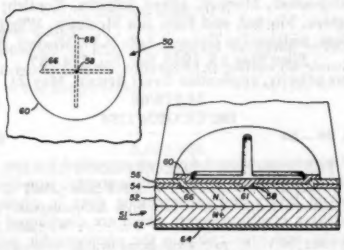
FORMATION OF SMALL DIMENSIONED APERTURES

Patrick W. Shaw, Bedford, England, assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of application Ser. No. 468,256, June 30, 1965, now abandoned , which is a continuation-in-part of application Ser. No. 406,990, Oct. 28, 1964, now abandoned. This application Dec. 16, 1969, Ser. No. 882,397

Int. Cl. G03c *5/00*

U.S. Cl. 96—35 **20 Claims**



Disclosed are methods for aperturing thin members by photochemical masking, exposing and etching techniques, such thin members may be a thin film of insulating material deposited or formed on a semiconductor substrate, or they may be a thin sheet or layer of material, such as metal.

3,653,899

PHOTOGRAPHIC MATERIALS AND PROCESSES

John A. Haefner, Webster, and Paul B. Gilman, Jr., Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 12, 1968, Ser. No. 775,165

Int. Cl. G03c *1/62, 5/24*

U.S. Cl. 96—48 PD **14 Claims**

This invention relates to a direct positive light sensitive photographic material comprising non-silver halide physically developable nuclei having adsorbed thereto an organic dye which is an electron acceptor and a process for preparing a positive metallic image comprising physically developing the same.

3,653,900

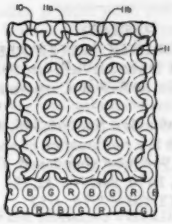
SELECTIVE ETCHING PROCESS FOR CHANGING SHADOW-MASK APERTURE SIZE

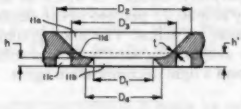
Joseph M. Black, Chicago, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Aug. 15, 1969, Ser. No. 850,408

Int. Cl. G03c *5/00*

U.S. Cl. 96—36.1 **6 Claims**





The shadow mask of a color picture tube is formed by etching a blank to provide a field of apertures individually having a large diameter portion and a coaxially aligned, small diameter portion attached to the former by a thin wall section. In screening a tube which is to utilize such a shadow mask for color selection, the phosphor materials are deposited on the screen in a photographic process involving the exposure of a layer of photosensitive material by actinic energy directed through the small diameter portions of the mask apertures. After screening has been accomplished, the thin wall sections are etched away, leaving the mask with apertures of large diameter, larger than the phosphor deposits in the screen.

3,653,901

COLOR KINESCOPE PRODUCTION WITH A TEMPORARY MASK

Robert William Etter, Lititz, Pa., assignor to RCA Corporation

Filed Oct. 31, 1969, Ser. No. 872,981

Int. Cl. G03c *5/00;* **H01j** *9/20*

U.S. Cl. 96—36.1 **4 Claims**

A method for producing a kinescope having an image screen and an apertured target mask, the apertures of the mask being temporarily reduced in size for use as a photographic master for producing the image screen. Such reduction in aperture size is achieved by providing the target mask with a coating of a film-forming material which exhibits shrinkage during drying thereof. The coating is comprised of a number of opaque film portions which individually close

the mask apertures and preferably are disposed on the aperture walls. The coating is dried so as to remove the central regions of the film portions, thereby providing a temporary mask with light-transmitting corridors in the film portions, such corridors being smaller in cross-section than the mask apertures. The temporary mask is used in screen printing. The shrinkable material is eliminated from the mask, after which the screen and target mask are incorporated into a kinescope.

3,653,902

PHOTOGRAPHIC MATERIALS

Norman T. Notley, and Irwin M. Senentz, Jr., both of New Orleans, La., assignors to Kalvar Corporation, New Orleans, La.

Continuation of application Ser. No. 766,356, Aug. 23, 1968, now abandoned , which is a continuation of application Ser. No. 405,597, Oct. 21, 1964, now abandoned. This application Apr. 28, 1970, Ser. No. 32,753

Int. Cl. G03c *5/18, 1/52*

U.S. Cl. 96—49 **8 Claims**

Vesicular photographic films having, as a vehicle, derivatives of polyvinyl alcohol in which at least 40 percent and preferably at least 75 percent of the alcohol groups are in the form of ester or acetal. The photographic materials are obtained by evaporating solvent from a solution containing the polymer and a light decomposable agent.

3,653,903

DIAZO-TYPE MULTICOLOR REPRODUCTION PROCESS

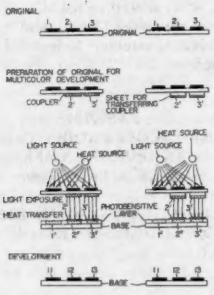
Kouzi Nihyakumen, Hirakata; Taizo Yokoyama, Osaka; Yasuo Ueda, Kobe; Yasutoki Kamezawa, and Tatsuo Aizawa, both of Osaka, all of Japan, assignors to Mita Industrial Company, Ltd., Osaka, Japan

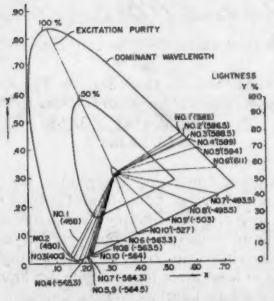
Filed July 31, 1970, Ser. No. 59,923

Claims priority, application Japan, Aug. 2, 1969, 44/60756

Int. Cl. G03c *5/18*

U.S. Cl. 96—49 **5 Claims**





A process for the diazo-type multicolor reproduction which comprises (A) exposing to light a diazo-type photosensitive material having a photosensitive layer containing at least one diazonium salt (*c*) and a coupler (*b*) having a substantially lower rate of coupling with the diazonium salt (*c*) than that of resorcin, said coupler being present in the photosensitive material in an amount of not greater than 1 mole per mole of said diazonium salt (*c*), and (B) heating a layer of at least one thermovolatile or thermosublimative coupler (*a*) disposed in a face-to-face contact with said photosensitive material at a predetermined portion, said steps being carried out coincidentally or in the order of (A) to (B) or (B) to (A), and then developing the exposed photosensitivematerial. photosensitive material.

3,653,904

RAPID PHOTOGRAPHIC PROCESSING SOLUTIONS AND METHOD

Murray Friedel, North Miami Beach, Fla., assignor to Visual Graphics Corporation, New York, N.Y.

Filed Feb. 13, 1970, Ser. No. 11,312

Int. Cl. G03c *5/26, 5/24, 5/30*

U.S. Cl. 96—50 **3 Claims**

Rapid processing of exposed photosensitive materials is achieved by the use of alkaline hydroquinone developers at an elevated temperature of from 75° to 125° F.

3,653,905

OXONOL DYES IN FILTER AND ANTI-HALATION LAYERS

Henri Depoorter, Mortsel; Alfred Rillaers, Kontich; Gerard Lemahieu, Mortsel, and Felix Jan Moelants, Wilrijk, all of Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Belgium

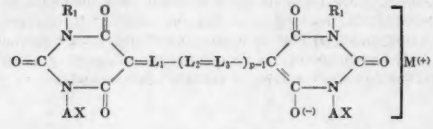
Filed May 13, 1969, Ser. No. 824,087

Claims priority, application Great Britain, May 21, 1968, 24,070/68

Int. Cl. G03c *1/84*

U.S. Cl. 96—84 **6 Claims**

Light-screening oxonol dyes are provided for use as filter dyes and anti-halation dyes in photographic non-light-sensitive colloid layers and as screening dyes in photographic light-sensitive emulsion layers which are discharged quickly, completely, and irreversibly in the photographic processing liquids even in the "lith"-type of developers. The novel light-screening dyes of the invention have the general formula:



wherein:

A stands for a branched or unbranched alkylene group including alkylene interrupted by one or more hetero atoms such as oxygen,

X stands for alkoxycarbonyl comprising in the alkoxy group at most 5 carbon atoms, hydroxyl, sulpho in acid or salt form, cyano, halogen such as chlorine or the group SO_2R wherein R stands for alkyl including substituted alkyl or aryl including substituted aryl,

R_1 stands for hydrogen, alkyl including substituted alkyl, e.g., the group AX, cycloalkyl, allyl, aralkyl including substituted aralkyl, aryl including substituted aryl,

each of L_1, L_2, and L_3 stands for methine including substituted methine, e.g., methine substituted by alkyl, aralkyl, aryl and carboxy,

M stands for a cation, e.g., a hydrogen cation, a metal cation or an onium cation of inorganic or organic nature such as ammonium and pyridinium, and

p stands for 1, 2, or 3.

3,653,906

PHOTOGRAPHIC MATERIAL CONTAINING ANTISTATIC COATING

Henry Walter Wood, Ilford, England, assignor to Ilford Limited, Ilford, England

Filed Sept. 29, 1969, Ser. No. 862,057
Claims priority, application Great Britain, Oct. 3, 1968, 47,039/68
Int. Cl. G03c *1/82*

U.S. Cl. 96—87 A **8 Claims**

This application describes photographic material which comprises a support base, at least one photographic emulsion layer on at least one side of said base, the material being characterized in that it has an outer antistatic layer which consists of a dried gelled layer which comprises sodium cellulose sulphate, which has a high degree of substitution, and a potassium salt.

3,653,907

THERMOGRAPHIC COPY SHEET CONTAINING 2,6,DICYCLOHEXYL

Charles H. Benbrook, Nashua, and Albert W. Leclair, Hudson, both of N.H., assignors to Nashua Corporation, Nashua, N.H.

Filed May 13, 1970, Ser. No. 37,050
Int. Cl. G03c *1/02*

U.S. Cl. 96—114.1 **1 Claim**

The presence of 2,6, dicyclohexyl cresol in a reducible silver salt-based thermo copy sheet improves the density and contrast of the image areas.

3,653,908

ANIMAL FOOD PRODUCT AND PROCESS

Marvin E. Buck, and Brian W. Smith, both of Battle Creek, Mich., assignors to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of application Ser. No. 696,155, Jan. 8, 1968, now abandoned. This application June 6, 1969, Ser. No. 789,400
Int. Cl. A23k *1/00, 1/10*

U.S. Cl. 99—2 **14 Claims**

Extrusion cooling of pasteurized meat slurry containing ungelatinized amylaceous material and preferably proteinaceous extracts produces a shelf stable 35–45 percent moisture extrudate that is shape retaining; sugars, alcohols, salts and acidulants serving to provide bacteriostasis.

3,653,909

RUMINANT FEED COMPOSITION

Benjamin B. Wilson, Colonial Heights, Va., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Feb. 9, 1970, Ser. No. 9,954
Int. Cl. A23k *1/00*

U.S. Cl. 99—2 R **10 Claims**

Ruminant feed compositions that improve the nitrogen intake retained by the ruminant and the production of volatile fatty acids in the rumen are formulated to contain protein, carbohydrates and as a source of nonprotein nitrogen, a mixture of urea and melamine. The ratio of the weight of the urea nitrogen to the weight of melamine nitrogen is preferably between about 0.8 and about 1.2 and the sum of the weight of the urea and melamine nitrogen constitutes preferably between about 25 and about 50 percent of the total nitrogen in the ruminant feed.

3,653,910

PROCESS FOR OBTAINING COFFEE AROMATICS

Esra Pitchon, Flushing, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Filed Dec. 5, 1969, Ser. No. 882,708
Int. Cl. A23f *1/08*

U.S. Cl. 99—71 **1 Claim**

By introducing steam into a bed of coffee to obtain steam distilled aromatics, the base extract obtained by extraction of the steamed coffee is more acid, and less desirable than extract obtained from unsteamed coffee. In the process of this invention, the steam is made to flow from the top of the bed of coffee, down through the bed. It was discovered that the extract obtained by extraction of coffee subjected to downflow steaming was less acidic and less degraded than extracts obtained from coffee treated with normal upflow of steam.

3,653,911

PROCESS FOR MAKING PRELIGHTENED COFFEE POWDER

John J. Mancuso, Astoria, N.Y.; Theodore F. Litchult, Ramsey, N.J., and Herman M. Dolezal, Valley Cottage, N.Y., assignors to General Food Corporation, White Plains, N.Y.

Filed Dec. 3, 1969, Ser. No. 881,888
Int. Cl. A23f *1/12*

U.S. Cl. 99—71 **6 Claims**

A prelightened coffee composition is made by mixing buffered coffee percolate with a coffee lightener composition and homogenizing the mixture. This mixture is then spray dried to produce a powder consisting of coffee solids and lightener solids, which has retained a high degree of lightening power and which does not exhibit any feathering when dissolved in hot water.

3,653,912

PREPARATION AND USE OF A BLAND DISPERSIBLE FOOD PROTEIN

William E. Koski; Donald E. Smith, and Ali R. Touba, all of Minneapolis, Minn., assignors to General Mills, Inc.

Filed Dec. 22, 1969, Ser. No. 887,308
Int. Cl. A23c *11/00*

U.S. Cl. 99—64 **10 Claims**

A beverage is provided which includes a soy product which has been modified by dispersing soy material in water, adding an alkaline substance such as sodium hydroxide to raise the pH to about 12 and then adding an acidic material to reduce the pH to about 7 to 8. The resulting solution may be spray dried. A high protein beverage may be produced by dissolving the modified dry soy material, for example, in water. The modified soy material may alternatively be added to cow's milk to provide a beverage of very high protein content. The beverage may include other flavoring material, such as chocolate.

3,653,913

INFUSION BAG

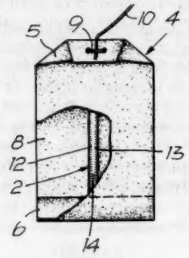
Adolf Rambold, Bachstrasse 8, Strump near Dusseldorf, Germany

Filed Mar. 28, 1969, Ser. No. 811,339
Claims priority, application Austria, Apr. 8, 1968, 3460/68; July 18, 1968, 6952/68
Int. Cl. B65b *29/02*

U.S. Cl. 99—77.1 **2 Claims**

An infusion bag containing a substance, for example, tea, for preparing a beverage consisting of a tube made from a rectangular strip of a thin filtering sheet material the longitudinal margins of which are folded together either with or without a covering strip so as to form a longitudinal joint consisting of at least three layers which are knurled together by a pair of meshing knurling wheels. The tube is divided by at least one transverse bend so as to form a pair of chambers for holding the infusible substance, and the opposite ends of

the tube are connected to each other so as to close the bag. While one of the knurling wheels for knurling the longitudinal joint preferably has continuous teeth, the other wheel



preferably has two parallel narrow rows of teeth. The tips of the teeth of at least one of the knurling wheels are preferably slightly ground off.

3,653,914

PRODUCTION OF TABLETS

William H. Schmitt, Elmhurst, Ill., assignor to Alberto-Culver Company, Melrose Park, Ill.

Continuation-in-part of application Ser. No. 652,688, July 12, 1967, now abandoned. This application Mar. 20, 1970, Ser. No. 21,511

Int. Cl. A23l *1/26;* **A61k** *9/00, 11/02*

U.S. Cl. 99—78 **25 Claims**

Molded effervescent triturate tablets or tablets formed by molding or compressing which have a matrix free of water insoluble polymers are contacted with a volatile organic solvent in which one or more materials comprising the tablet are at least partially soluble. The volatile solvent is removed causing the organic solvent solubilized material to be redeposited in situ. This causes an increase in the hardness and a decrease in the friability characteristics of the tablet. The tablet matrix can contain an edible acid, an edible acid coupled with a carbonate, sweeteners including the water soluble synthetic type, flavoring agents, medicinal ingredients, and detergents.

3,653,915

TORTILLA AND PROCESS USING MONO-OR DIGLYCERIDE

Manuel Jesus Rubio, 192 Benham Ave., Bridgeport, Conn.

Filed June 8, 1970, Ser. No. 44,586

Int. Cl. A21d *2/10*

U.S. Cl. 99—80 R **6 Claims**

To retard the staling of tortillas, which are an unleavened unshortened food product made from nixtamalized corn or corn flour by incorporating an additive in making the tortilla dough. The additive is mono- or diglyceride or the like.

3,653,916

PROCESS FOR PRODUCING AN ONION FLAVORED SNACK

Robert O. Straughn, and Richard D. Reinhart, both of Minneapolis, Minn., assignors to General Mills, Inc.

Filed Dec. 29, 1969, Ser. No. 888,814

Int. Cl. A23l *1/18*

U.S. Cl. 99—81 **6 Claims**

Preparing a puffed snack product by blending dry ingredients including a meal, onion flavoring and sugar. Sufficient water is added to the blend to raise the total moisture content, by weight, to between 13 and 15 percent. The mixture is tempered for between one-half hour and 8 hours. The mixture is treated in a collet extruder where the temperature is raised to between 255° and 310° F. and the pressure is between 950 and 1,350 pounds per square inch gauge. The mixture expands upon extrusion and is cut into pieces which are toasted and enrobed with an edible oil and salt.

3,653,917

ANGEL FOOD CAKE MIXES AND THEIR PRODUCTION

Issac J. Wahba, Minneapolis; Daniel F. Padrnos, Hamel, and Shao-Mu Ma, Minneapolis, all of Minn., assignors to General Mills, Inc.

Filed Feb. 5, 1970, Ser. No. 9,035

Int. Cl. A21d *2/00;* **A23l** *1/00*

U.S. Cl. 99—94 **5 Claims**

Tolerance of certain angel food cake mixes is improved by the addition of calcium chloride.

3,653,918

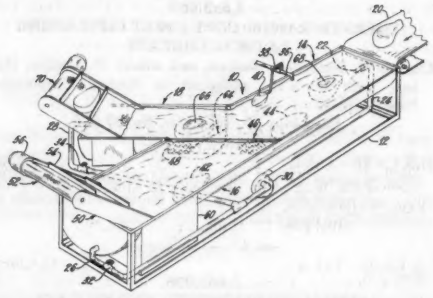
METHOD OF PROCESSING HAMS

Charles H. Wallace, 5960 Flanders Road, Sylvania, Ohio

Filed Dec. 22, 1969, Ser. No. 886,826

Int. Cl. A22c *18/00*

U.S. Cl. 99—107 **2 Claims**



A method and apparatus for grading or sorting hams are provided. The hams are placed in a container of brine of a predetermined density with the fatter hams tending to float and the leaner ones tending to sink. Those near the surface of the brine in the container are sold with minimum or no trimming while those near the bottom are de-boned and the fat is removed for sale at a premium price. In the particular apparatus, the hams move along a trough containing the brine which is supplied at one location and removed from another for recirculation. A conveyor at one position in the trough removes the floating hams and a conveyor at another position removes the sunken hams.

3,653,919

PRODUCTION OF CHEESE CURD

Claude Giddey, and Georges Dove, both of Geneva, Switzerland, assignors to Alfa-Laval AB, Tumba, Switzerland

Filed Aug. 19, 1969, Ser. No. 851,459

Claims priority, application Switzerland, Aug. 20, 1968, 12497/68; July 23, 1969, 11258/69

Int. Cl. A23c *19/02*

U.S. Cl. 99—116 **26 Claims**

Concentrated milk with a dry substance content of about 30 percent is renneted at 15° to 30° C. for 5 to 15 minutes to insolubilize the casein and obtain a homogeneous non-gelled viscous mass, which is then cooled below 10° C.; and thereafter parallel streams of the renneted milk are heated rapidly to 25° to 45° C. to polymerize the casein and obtain curd in the streams. The curd is then washed in an aqueous bath, separated from the bath, and finally re-collected to form a homogeneous mass.

3,653,920

THIA-ALKANETHIOLS AS MEAT FLAVORS

Hendrik Willem Brinkman, Velp, and Arnoldus van der Heyden, Zevenaar, both of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed June 18, 1970, Ser. No. 47,622
Int. Cl. A23l *1/26*
U.S. Cl. 99—140 R 7 Claims

A meat flavor is given or enhanced in foodstuffs by addition of thia-alkanethiols of formula $R^1—S—CH(SH)—R^2$ where R^1 and R^2 are methyl or ethyl radicals.

3,653,921

BUTTER FLAVORED FOOD ADDITIVE CONCENTRATE

Allen C. Buhler, Racine, Wis.; Eric Engel, Winnetka, Ill.; John H. Nelson, Waukesha, and Clyde H. Amundson, Madison, both of Wis., assignors to Morton-Norwich Products, Inc., Chicago, Ill.

Continuation-in-part of application Ser. No. 751,743, Aug. 12, 1968, now abandoned. This application Mar. 27, 1969, Ser. No. 811,214
Int. Cl. A23l *1/26*
U.S. Cl. 99—140 R 20 Claims

A concentrated butter flavorant and a method of manufacturing the same for addition to food to impart a butter-like flavor thereto comprising a lipase enzyme-modified milk fat, flavor and aroma principles, a diluent, and a bicarbonate buffering agent. The concentrate may be diluted as desired for specialized uses and may be provided in dry form.

3,653,922

METHOD OF PREPARING A LOW CALORIE PULVERULENT OR GRANULAR SWEETENING COMPOSITION

William H. Schmitt, Elmhurst, and Robert A. Lukey, Northbrook, both of Ill., assignors to Alberto-Culver Company, Melrose Park, Ill.

Filed Feb. 12, 1968, Ser. No. 704,792
Int. Cl. A23l *1/26*
U.S. Cl. 99—141 A 11 Claims

Pulverulent or granular free-flowing water-soluble low calorie sweetening compositions having the general appearance of sucrose are prepared by subjecting an aqueous composition or solution containing from 60 to 80 percent solids in the form of a distinctly major proportion of a water-soluble starch hydrolysate having a dextrose equivalent in the range up to 25 and a small amount of an essentially noncaloric artificial sweetener to drying under atmospheric conditions on a double drum dryer under controlled conditions.

3,653,923

SWEETENING COMPOSITION

Kiyofumi Ishii, Ikeda; Jun Toda, Suita; Hisashi Aoki, Suita, and Hideo Wakabayashi, Suita, all of Japan, assignors to Takeda Chemical Industries, Ltd., Higashi-ku, Osaka, Japan

Filed Feb. 27, 1969, Ser. No. 803,089
Claims priority, application Japan, Mar. 20, 1968, 43/18137
Int. Cl. A23l *1/26*
U.S. Cl. 99—141 A 8 Claims

A remarkable synergistic action in sweetening effect is exhibited between neohesperidin dihydrochalcone and a saccharin sweetener by employing both in a ratio of from about 0.1:1 to about 3:1.

3,653,924

METHOD OF PREPARING GLAZED FOOD PRODUCTS

Edgar W. Penton, Auburn, Wash., assignor to Eduardo's Industries, Auburn, Wash.

Filed Feb. 19, 1970, Ser. No. 12,638
Int. Cl. A23b *1/10, 3/14, 7/00*
U.S. Cl. 99—168 15 Claims

Glazed food products are prepared by mixing together and mutually extracting predetermined quantities of a liquid fat, water and solid pieces of seasoning materials. The resulting mixture is permitted to separate into a clear liquid fat phase containing the fat soluble fraction of the seasoning material and a water phase containing dispersed pieces of the fat-insoluble fraction of the seasoning materials. The two phases are separated, after which the water phase and selected batter-forming solids are mixed in proportions predetermined to form a liquid batter. Pieces of poultry, fish, meat, vegetables or other foods are coated with the batter, breaded if desired, and thereafter glazed with the seasoned liquid fat phase. The food pieces may be frozen either before or after being glazed.

3,653,925

METHOD OF PREPARING GLUTEN CONTAINING FILMS AND COATINGS

Charles A. Anker; George A. Foster, Jr., and Mary Ann Loader, all of Minneapolis, Minn., assignors to General Mills, Inc.

Filed Sept. 18, 1969, Ser. No. 859,213
Int. Cl. A23b *7/00*; C08h *7/00, 17/26*
U.S. Cl. 99—166 12 Claims

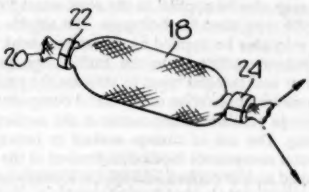
Dried wheat gluten is dispersed in an alkaline medium consisting of alcohol and water. The dispersion is applied to solid substrates including food and dried to form an edible coating. The coating can be stripped from the substrate as a continuous film. A portion of a second proteinaceous substance and a plasticizer can be included in the dispersion.

3,653,926

METHOD OF PREPARING A POULTRY PRODUCT

Joseph H. Armellino, 25 Melville Road, Huntington Station, N.Y.

Continuation-in-part of application Ser. No. 877,014, Nov. 14, 1969, now abandoned , which is a continuation-in-part of application Ser. No. 579,243, Sept. 14, 1966, now abandoned. This application Dec. 22, 1970, Ser. No. 100,653
Int. Cl. B65b *25/06*
U.S. Cl. 99—174 3 Claims



A method for preparing a poultry food product wherein the poultry pieces, without any additives, are placed within a pair of sleeves, one of which is substantially liquid impervious plastic material, selectively perforated, and the other sleeve is of open fabric-like material having substantial tensile strength, and pressure is thereafter applied which is sufficient of itself to amalgamate the poultry product by twisting one end of both sleeves containing the poultry pieces.

3,653,927

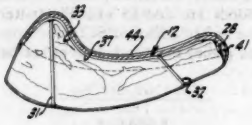
A METHOD OF PACKAGING MEAT

Lawrence E. Howell, and Howard Vance Bailiff, both of Sacramento, Calif., assignors to Western Meats; Lawrence E. Howell and Howard Vance Bailiff, Sacramento, Calif., part interest to each

Filed Dec. 31, 1969, Ser. No. 889,614
Int. Cl. B65b *25/06*
U.S. Cl. 99—174 2 Claims

Rough-textured, reinforced paper towel stock is impregnated with a food-grade wax and cut into sheets large enough to cover and project substantially outwardly from the

periphery of the concave side of a bone-in and tied cut of meat, such as roast-ready rib, or the like. The overhanging projecting margin of the wax paper material is thereupon folded downwardly substantially at right angles, to cover any exposed bone on the edges or ends of the cut and to afford a peripheral skirt, or apron around the upper portion of the



cut. The wrapped meat is then placed in a heat-shrinkable bag, and following air removal and sealing, the bag is subjected to heat so as to effect shrinkage of the bag into skin-tight relation with the enclosed meat. The bag and contents are thereupon removed and transferred elsewhere, such as to storage or shipment.

3,653,928

EASILY PEELED SYNTHETIC CASING

Henry J. Rose; Albin F. Turbak, and Thomas E. Leahy, all of Danville, Ill., assignors to Tee-Pak, Inc., Chicago, Ill.

Filed June 30, 1969, Ser. No. 837,873
Int. Cl. A22c *13/00*
U.S. Cl. 99—176 **6 Claims**

Sausages, such as frankfurters and bolognas, formed in synthetic casings are more easily peeled by soaking the casings; either at the time of manufacture or after stuffing with sausage emulsion, with a soluble non-toxic food grade salt, complex, or coordination compound of iron, aluminum, calcium or magnesium which will interact with components of the sausage emulsion to modify the surface characteristics of the sausage. The soluble metal compounds are preferably applied to frankfurter sausage casings at the time of manufacture just prior to drying the casing. The soluble metal compounds may also be applied to the soak water for larger casings of the type used for bolognas. The soluble metal compounds may also be applied as an external soak bath to the casing before stuffing or to the stuffed sausages, both the frankfurter and bologna types to saturate the casing and provide a uniform application of the metal compound to interact with sausage emulsion components at the surface contacting the casing. The use of casings soaked or impregnated with these metal compounds facilitates removal of the casing from the smoked and/or cooked sausages at a time when untreated casing could not be peeled from the sausage.

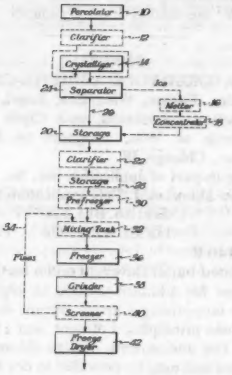
3,653,929

PROCESS OF FREEZE DRYING COFFEE

Daniel E. Dwyer, Westbury, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of application Ser. No. 846,805, Aug. 1, 1969, and a continuation-in-part of 855,995, Sept. 8, 1969. This application Oct. 21, 1969, Ser. No. 868,090
Int. Cl. B01d *1/00;* **A23f** *1/08*
U.S. Cl. 99—199 C **18 Claims**

Percolated coffee extract is freeze concentrated, frozen, ground, and separated so that about 90 percent of the particles are sized from about 200–4,000 microns prior to freeze drying. Insoluble solids are removed either before or after freeze concentration. The ice separated in freeze concentration is melted, concentrated and returned to the processing stream to recover solids contained therein. The concentrated extract is bulked before freezing to facilitate control of its flow and to optimize its granular structure. Bulking is attained by inserting gas or fines or a combination thereof into the extract. The ground particles are screened prior to freeze drying, which is accomplished in two phases. The first phase has a high heat energy input at a platen temperature of 200°–250° F. and an absolute pressure of below 500 microns until a particle moisture content of about 40 to 50 percent by wt. is attained. The expression platen temperature as used herein means the temperature of the heated element (and



heating medium therein) contacted directly or indirectly by the product being freeze dried, which is at a somewhat lower temperature. Then the absolute pressure is lowered to below 200 microns with a reduced heat input at a platen temperature of 100°–120° F. until a stable particle moisture content of about 1.0 to 2.5 percent by wt. is attained.

3,653,930

ONE PACKAGE ZINC RICH PROTECTIVE COATING

Gabriel H. Law, Orange, and Walter Michael McMahon, La Habra Heights, both of Calif., assignors to Ameron Inc., Brea, Calif.

Continuation-in-part of application Ser. No. 725,192, Apr. 29, 1968, and a continuation-in-part of 772,049, Oct. 30, 1968. This application Oct. 22, 1969, Ser. No. 868,618
Int. Cl. C09d *5/10*
U.S. Cl. 106—1 **9 Claims**

One package zinc rich coatings for the protection of ferrous surfaces. The coatings contain zinc dust in a vehicle comprising an organic polysilicate, an amine or other hydroxyl source and a solvent. The ratio of vehicle ingredients is selected so that the volume average dielectric constant of the vehicle is below approximately 14, thus insuring that the zinc dust will not pack or settle into a hard mass and will be readily redispersible even after prolonged storage in a closed container. Upon application to a surface, atmospheric moisture reacts with the amine to provide OH ions, which in turn hydrolyze the polysilicate to form a tough adherent silicate binder for the zinc.

Gas evolution in the inventive one package coatings is eliminated by incorporation of particular compounds in the coating vehicle. In a typical embodiment, an alkyl or aryl nitrocompound is used which combines with the evolving hydrogen, producing as a by-product an amine which enchances the coating effectiveness. In other embodiments, cycloketones or lead oxide compounds are used to inhibit hydrogen gas evolution.

3,653,931

ANTI-TARNISH COMPOSITION FOR METAL SURFACES AND PROCESS FOR ITS USE

Peter Jochen Borchert, Elkhart, Ind.; James Edward Slager, Edwardsburg, Mich.; Ronald George Sommer, Mishawaka, and Mitchell Frank Zienty, Elkhart, both of Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Dec. 30, 1970, Ser. No. 102,988
Int. Cl. C09g *1/14*
U.S. Cl. 106—3 6 Claims

The clean surface of metals, such as copper and copper-containing alloys, can be protected from tarnishing by a composition containing a mixture of a surfactant, benzotriazole, sodium bisulfite and ethylenediaminetetraacetic acid. This composition is generally mixed with water and the clean metal surface is dipped in or otherwise contacted with the aqueous solution.

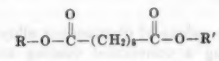
3,653,932

ELECTROSTATIC PRINTING COMPOSITION COMPRISING DIDODECYL SEBACATE

James M. Berry, Deerfield, and Gary P. Corpron, Skokie, both of Ill., assignors to Teletype Corporation, Skokie, Ill.

Filed Aug. 28, 1969, Ser. No. 853,889
Int. Cl. C09d *11/00, 13/00*
U.S. Cl. 106—22 7 Claims

Printing is effected with a hot melt type ink comprised of coloring material and a vehicle therefor and having a resistivity within the range of about 10^8 to about 10^{11} ohm-centimeters and a viscosity in a range with an upper limit of about 50 centipoises when in a liquid phase. To that end, a stream of ink drops are drawn across and deflected in a span between an ink supply and a carrier for impingement thereon. The vehicle of the ink is comprised of at least one compound which is solid at room temperature, and has the general formula:



in which each R and R′ is an alkyl group containing from one to 12 carbon atoms.

3,653,933

ANOMALOUS DISPERSION OPTICAL GLASS HAVING A GOOD WEATHER PROOF CHARACTERISTIC

Munehisa Tsunekawa, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Aug. 22, 1969, Ser. No. 852,381
Claims priority, application Japan, Aug. 31, 1968, 43/62125
Int. Cl. C03c *3/00, 3/08, 3/10*
U.S. Cl. 106—47 Q 4 Claims

This invention provides an anomalous dispersion optical glass having a good weatherproof characteristic, in which the composition (mixing composition) range of the glass in weight percent is essentially as follows:

B_2O_3	$10 \sim 40$
SiO_2	$3 \sim 45$
$SiO_2 + 25 \geqq B_2O_3 \geqq 30 - 1/2\ SiO_2$	
Al_2O_3	$8 \sim 12$
PbO	$25 \sim 60$

and a portion of PbO is replaced with 0–8 weight percent of La_2O_3 and/or RO when desired, and, a portion of PbO is replaced with at least 3 weight percent of La_2O_3 and/or CaO when $B_2O_3 > SiO_2 + 20$ is satisfied or when $SiO_2 + 20 \quad B_2O_3$ and $B_2O_3 \quad 35$ are both satisfied, and N_d and V_d lie within the ranges $N_d = 1.52–1.74$ and $V_d = 33–52$.

3,653,934

COMPOSITION FOR MAKING GASTRO-RESISTANT GELATIN CAPSULES

Fernand Jacques Rolle, Beinheim, France, assignor to R. P. Scherr Corporation

Filed Dec. 23, 1969, Ser. No. 887,787
Claims priority, application France, Dec. 27, 1968, 181144
Int. Cl. C09d *3/04*
U.S. Cl. 106—125 2 Claims

The invention provides a new gelatine composition suitable for producing capsules having better resistance to enzymes, better mechanical strength, improved resistance to moisture and a longer storage life than known capsules. This composition essentially comprises the combination product of gelatine, water, glycerine and/or sorbitol and a silicone fluid having an intrinsic viscosity of from 100 to 12,500.

3,653,935

STABILIZING CERTAIN NITROGEN-CONTAINING DERIVATIVES OF CELLULOSE

Brazelton Fulkerson, and John W. Mench, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of application Ser. No. 653,646, July 17, 1967, now abandoned. This application June 4, 1969, Ser. No. 830,546
Int. Cl. C08b *27/42*
U.S. Cl. 106—189 5 Claims

Certain nitrogen-containing derivatives of cellulose (products from the reaction of unsaturated cellulose esters or ethers with organic nitrogen-containing bases) spontaneously degrade when they are warmed slightly above room temperature to yield products that are insoluble in common organic solvents such as acetone, whereas the N-containing cellulosic materials, as originally prepared, exhibit high solubility in such solvents. It has been discovered that a small amount of phenolic type organic antioxidant inhibits such undesirable spontaneous degradation.

3,653,936

PIGMENT PREPARATIONS

Karlheinz Wolf, Cologne-Stammheim; Artur Haus, Leverkusen; Reinhold Hornle, Cologne-Flittard, and Theodor Mager, Leverkusen, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 8, 1969, Ser. No. 814,463
Claims priority, application Germany, Apr. 17, 1968, P 17 67 245.6
Int. Cl. C09c
U.S. Cl. 106—288 Q 8 Claims

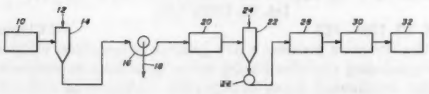
Pigments are treated by contacting them with a mixture of (a) a resinic acid, e.g., colophony, or a salt of a resinic acid; and (b) a primary or secondary amine having the formula

in which R is a five- to six-membered, optionally substituted cycloaliphatic radical; and R_1 is hydrogen, R, or an alkyl group optionally substituted by an NH_2 group and containing two to four carbon atoms, or by preparing the neutral or acidic aqueous pigment in the presence of the treating agents (a) and (b). The treated pigments exhibit advantages such as better gloss and covering power.

3,653,937
ALUMINA TRIHYDRATE PIGMENT AND PROCESS FOR THE PREPARATION THEREOF

James J. Koenig, Belleville, Ill., and Leroy D. Hart, St. Louis, Mo., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Aug. 11, 1969, Ser. No. 849,081
Int. Cl. C09c 1/40; C01f 7/02
U.S. Cl. 106—288 B 8 Claims



Alumina trihydrate of an average particle size of less than about 0.7 micron and a dispersibility in water of at least about 70 percent by weight. The trihydrate is prepared by heating a slurry containing a mix of alumina hydrate of a particle size of less than 0.7 micron and an alkaline solution at 150°–200° F. for from 5 to 45 minutes, separating the resulting alumina trihydrate from the slurry, dispersing it with the aid of a dispersing agent, and then drying it.

3,653,938
PROCESS FOR THE PRODUCTION OF A TRANSPARENT ORIGINAL

Kazuo Obuchi, No. 22, Nakajima, and Satoru Honjo, No. 23, Nakajima, both of Odawara-shi, Kanagawa-ken, Japan

Continuation-in-part of application Ser. No. 400,231, Sept. 29, 1964, now abandoned. This application Oct. 28, 1968, Ser. No. 777,968
Claims priority, application Japan, Sept. 30, 1963, 38/51841
Int. Cl. B41m 5/00
U.S. Cl. 117—15 6 Claims

Transparent originals capable of giving superior light transmission, are prepared by applying a blushing layer containing at least one of a nitrocellulose and a linear polyester resin soluble in organic solvents, onto a transparent support, marking the blushing layer, and smoothening it out with a solvent.

3,653,939
SCREENING OF BLACK-SURROUND COLOR PICTURE TUBES

Charles J. Prazak, III, Elmhurst, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Jan. 5, 1970, Ser. No. 580
Int. Cl. C03c 3/28, 17/00; F21v 9/16
U.S. Cl. 117—33.5 CM 3 Claims

The screen of a black-surround color picture tube is provided with a discontinuous coating of light-absorbing material, discontinuous in that the light-absorbing material is applied to surround those elemental areas of the screen which are to receive deposits of phosphor. The screen is then heated so that the exposed elemental screen areas and the light-absorbing coating attain a uniform temperature. A slurry, including a chosen one of the three phosphor materials, is then dispensed onto the screen and distributed to establish a layer of slurry of a desired thickness over the entire screen surface. The excess slurry is removed by tilting the screen to effect dumping. The slurry layer is then set, without the application of heat, and after the layer has been set, heat is applied to dry the layer. Thereafter, screening continues in conventional fashion.

3,653,940
TITANIUM AND TITANIUM ALLOY WITH LUBRICANT COATED SURFACE

Robert A. Ohlbaum, Silver Spring; Charles A. Zanis, and Joseph R. Crisci, both of Bowie, all of Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed Apr. 30, 1970, Ser. No. 33,454
Int. Cl. B32b 15/08; B44d 1/42
U.S. Cl. 117—26 2 Claims

GALLING TESTS ON Ti 13V-11Cr-3Al AND VARIOUS COATINGS IN SEA WATER

COATING	NUMBER OF CYCLES TO FAILURE	AVERAGE NUMBER OF CYCLES TO START GALLING
GRAPH BRAW + TEFLON PASTE	3,3,3	3
NONE	1, 1	1
FLUORIDE IMPREGNATION + GREASE	2, 2	2
MOLYBDENUM DISULFIDE	1, 1, 1	1
TEFLON IMPREGNATION	22, 22, 26, 25, 23, 27	24
TEFLON ASPHALTIC GREASE	100, 70, 51, 85, 115, 47	79
GRAPH BRAW + MOLYKOTE	24, 23, 19, 15	21
GRAPH BRAW + ASPHALTIC GREASE	30, 17, 15, 23, 45, 32	29
TEFLON IMPREGNATION + MOLYBDENUM SULFIDE + THIN COAT ASPHALTIC GREASE	83, 200, 200	160
IMPROVED PLOW STEEL WIRE	42, 40, 40	40

Minimizing the galling of titanium (or alloys) in sea water by first providing a conversion coating such as an impregnated coating of polytetrafluoroethylene, then overlaying with a coating of molybdenum disulfide and a final outer coating of asphaltic grease. An apparatus for evaluating galling of titanium wires under extreme pressure wherein a rope or wire is supported on a reciprocating weighted crank arm and abuts a stationary wire. The weighted arm applies the necessary pressure and imparts relative motion between the wires, and thereby causes repeatable galling results.

3,653,941
SLURRY PROCESS FOR COATING PARTICULATE MATERIAL UPON A SURFACE

Barry Bernard Bell, and Wellington Edward Pederson, both of Lancaster, Pa., assignors to RCA Corporation

Filed Mar. 2, 1970, Ser. No. 15,672
Int. Cl. H01j 31/20
U.S. Cl. 117—33.5 C 7 Claims

A process for coating a flatlike, concave, nonporous surface, such as a surface of a viewing window for a cathode-ray tube, with particulate material comprising the steps in the following order:

A. rotating the surface and dispensing onto the central portion of the surface a puddle of slurry comprised of a particulate material and a liquid vehicle,

B. rotating the surface and spreading the puddle outwardly over the surface to the margins thereof,

C. further rotating the surface and spreading the puddle inwardly over the surface,

D. and further rotating the surface and spreading the puddle outwardly over the surface to the margins thereof.

3,653,942

METHOD OF CONTROLLING TEMPERATURE DISTRIBUTION OF A SPACECRAFT

Carl P. Boebel, Tipp City, and Gary E. Stevenson, Xenia, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force

Filed Apr. 28, 1970, Ser. No. 32,770
Int. Cl. B44d *1/36;* **B64c** *1/40*
U.S. Cl. 117—33.3 **6 Claims**

A method of controlling the temperature distribution of a spacecraft is provided which comprises forming on at least a portion of the external surface of the spacecraft a coating comprising metal flakes embedded in a polymeric binder.

3,653,943

BIS OXAZOLES AS BRIGHTENERS FOR FIBERS AND PLASTICS

Henry Xavier Kaempfen, Hillsboro Township, Somerset County, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed May 4, 1970, Ser. No. 34,516
Int. Cl. B44d *5/00;* **C09k** *1/02;* **C07d** *85/44*
U.S. Cl. 117—33.5 R **7 Claims**

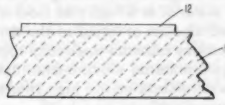
Natural and synthetic fibers and plastics are brightened by applying thereto 2,2′-bisnaphthoxazolyl and 2-(benzoxazol-2-yl)naphthoxazole compounds. Fibers brightened include cellulose, polyamide and polyester. Plastics brightened include polyvinyl chloride, polyethylene and polyester.

3,653,944

PRESSURE SENSITIVE IMAGE TRANSFER MEDIA

Gerry H. Ehrhardt, West Des Moines; Ronald L. Reeves, and David L. Siglin, both of Des Moines, all of Iowa, assignors to Pacific Industries Inc., New York, N.Y.

Filed Dec. 11, 1969, Ser. No. 884,202
Int. Cl. B41m *5/10*
U.S. Cl. 117—36.1 **8 Claims**



Improved pressure sensitive image transfer media wherein the transfer coating is formed by the aged residue of a hot melt applied dispersion of a hard wax base material, fillers and pigments and a multi-component composite plasticizing oil.

3,653,945

PRODUCTION OF REACTANT SHEETS FOR DEVELOPING COLORLESS DYE IMAGES

Gerald T. Davis, and Robert A. Fetters, both of Chillicothe, Ohio, assignors to The Mead Corporation, Dayton, Ohio

Continuation-in-part of application Ser. No. 610,766, Jan. 23, 1967. This application Oct. 29, 1970, Ser. No. 85,242
Int. Cl. B41m *5/22*
U.S. Cl. 117—36.2 **6 Claims**

Bond-like reactant sheets for use developing colored images on the surfaces thereof formed from colorless dyes are produced by applying to a paper substrate a volatile organic solvent solution of phenol-formaldehyde polymer and quickly evaporating the solvent before substantial penetration of the paper substrate, whereby a uniform discontinuous film of said polymer is formed on the exposed surface of the top layer of fibers or pigments particles of said substrate, said dried polymer film being applied at the rate of 0.01 to 0.2 pound per 1,300 square feet of surface. A preferred method of applying said solvent solution of phenol-formaldehyde polymer is by modified offset gravure printing means.

3,653,946

METHOD OF DEPOSITING AN ADHERENT GOLD FILM ON THE SURFACES OF A SUITABLE SUBSTRATE

Gerald B. Fefferman, Parsippany, N.J., assignor to Bell Telephone Laboratories, Incorporated, Berkeley Heights, N.J.

Filed Sept. 30, 1969, Ser. No. 862,481
Int. Cl. C03c *17/10;* **B44d** *1/18*
U.S. Cl. 117—46 CA **6 Claims**

An adherent gold film is formed on a suitable substrate by the decomposition of organic resinates. A gold resinate is combined with at least two resinates selected from the group consisting of lead resinate, silicon resinate and boron resinate which, upon decomposition in air or an oxidizing atmosphere, form inorganic oxides. The resinate mixture is applied to the substrate and the substrate is fired to a temperature sufficient to (1) decompose the resinate mixture to form free gold and the inorganic oxides, (2) combine the inorganic oxides in situ on the surfaces of the substrate and (3) combine the free gold with the combined oxides to form an adherent gold layer containing 90 to 98 percent by weight of gold. Additional gold may be electrolytically deposited on the substrate to obtain a film of the desired thickness.

3,653,947

SURFACE-PRETREATMENT OF NON-METALLIC ARTICLES FOR CHEMICAL NICKEL-PLATING

Joachim Kandler, Lechenich; Gerhard Mietens, Efferen near Cologne, and Michael Ahlgrim, Bliesheim, all of Germany, assignors to Knapsack Aktiengesellschaft, Knapsack near Cologne, Germany

Filed July 22, 1969, Ser. No. 843,811
Claims priority, application Germany, Aug. 1, 1968, P 17 71 930.1
Int. Cl. C23c *3/02*
U.S. Cl. 117—47 A **9 Claims**

Pretreatment of surfaces of non-metallic articles for chemical nickel-plating. The surface of the article is treated using a pickling solution of concentrated sulfuric acid containing one or more noble metal salts and the noble metal salt adhered to the surface of the article is subsequently reduced to metal to activate the surface, using an aqueous solution of a reducing agent. The pickling step and the reductive activation of the surface of the article are carried out while using the solutions at a uniform temperature of between about 75° and 90° C., and adding a polyphosphonic acid stabilizer to the aqueous solution of the reducing agent.

3,653,948

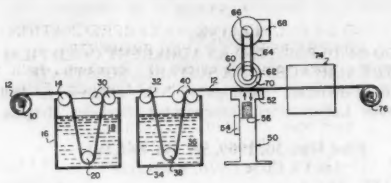
PROCESS AND APPARATUS FOR COMPRESSING STRING-FORMING POLYMER SUBSTANCES BY MECHANICAL VIBRATION

Dieter Kaempgen, Wiesbaden-Freudenberg; Willi J. Schmidt, Hahn/Taunus, and Walter Seifried, Wiesbaden-Biebrich, all of Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

Filed Nov. 27, 1968, Ser. No. 779,551
Claims priority, application Germany, Nov. 30, 1967, P 17 04 777.7
Int. Cl. B44d *1/44*
U.S. Cl. 117—65.2 **1 Claim**

A porous sheet of material is first passed through an impregnation bath containing a polymer solution and then through a coagulation bath which produces string-forming polymers physically incorporated in the pores of the sheet. The sheet is then passed between a relatively rigid vibrating

means engaging one side thereof and a resilient pressure means engaging the opposite side thereof, the resilient pressure means holding the sheet of material in contact with the vibrating means. The sheet is subsequently dried.

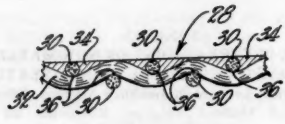


3,653,949

COATED FABRICS AND METHODS FOR APPLYING COATINGS THERETO

James J. Dillon, Providence, R.I., assignor to Owens-Corning Fiberglas Corporation

Filed Sept. 5, 1969, Ser. No. 855,513
Int. Cl. B32b *17/04;* **C03c** *25/02*
U.S. Cl. 117—66 **5 Claims**



Glass fibers in the form of yarns and fabrics are provided with a surface treatment to improve their resistance to abrasion and flammability by coating the yarns and fabrics with a thickened dispersion of very fine particles of a solid organic polymeric material, drying and sintering this coating through various heating zones, and optionally padding the treated yarns and fabric with a lubricant to ensure flexibility thereof.

3,653,950

HIGH IMPACT RESISTANT THERMOPLASTIC SUBSTRATE COATED WITH NON-EMBRITTLING PAINT SYSTEM

Patrick V. Bonsignore, Levittown, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Apr. 22, 1970, Ser. No. 30,967
Int. Cl. B32b *27/40*
U.S. Cl. 117—72 **8 Claims**

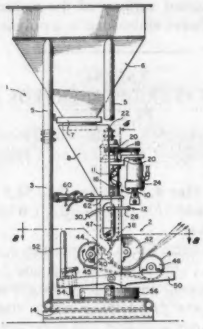
Rigid sheets of high impact resistant thermoplastic polymers coated with a polyurethane elastomer exhibit improved resistance to crack propagation into the sheet substrate from brittle paint coats. The preferred urethane elastomers used to coat the impact resistant thermoplastic polymers are saturated and fully reacted polymers which are the reaction products of a diisocyanate and a polyhydroxy compound which elastomers impart microknife adhesion values to the substrate of between 0.10 and 0.28. Preferably the polyhydroxy compound is a polyhydroxy-containing polyester and the diisocyanate is an aliphatic or alicyclic diisocyanate. The preferred thermoplastic polymer consists of a block polymer comprising a block of thermoplastic polymer derived from esters of methacrylic acid joined to blocks of urethane modifier comprising the residue of the reaction of a polyhydroxy-containing polyester, an aliphatic or alicyclic diisocyanate and a glycol, the modifier terminated with a functional monomer capable of ethylenic polymerization grafting with the acrylic polymer.

3,653,951

METHOD FOR RAPIDLY COATING SURFACES WITH WET, PARTICULATE MATERIALS

Lewis Fritts Maldeis, Hinsdale, Ill., and Aubrey Meredith Shideler, Medina, Ohio, assignors to Martin Marietta Corporation

Filed Apr. 3, 1969, Ser. No. 813,193
Int. Cl. B44d *1/08, 1/02*
U.S. Cl. 117—104 R **11 Claims**



An apparatus for rapidly coating a distant surface with wet, particulate material, which includes thrower means having a high speed endless slinger belt for projecting wet, particulate material at a high rate onto a distant surface; storage means for storing dry, particulate material, and feed metering and mixing means for successively and continuously metering the dry material from the storage means, mixing liquid with the dry material and discharging the resulting wet, particulate material at the high rate onto a selected area of the belt.

A method for coating wet, particulate material onto a distant surface at a high rate including the steps of metering dry, particulate material at a high rate from a storage means, adding a metered amount of liquid to the dry material, mixing the liquid and dry material uniformly together, metering the resulting liquid-material mixture onto a slinger belt and projecting the wet mixture at the high rate as a continuous ribbon onto a distant surface.

3,653,952

DYEABLE RESIN BONDED FIBROUS SUBSTRATES

Domenick D. Gagliardi, deceased, late of East Greenwich, R.I. (by Frances Dodge Gagliardi, executrix), assignor to Union Carbide Corporation

Original application Apr. 8, 1959, Ser. No. 804,870, now Patent No. 3,545,909, dated Dec. 8, 1970, Continuation-in-part of application Ser. No. 744,675, June 26, 1958, now abandoned. Divided and this application June 16, 1970, Ser. No. 46,812
Int. Cl. C03c *25/02;* **D06p** *1/76*
U.S. Cl. 117—126 GN **4 Claims**

Fibrous substrate coated with an elastomer, an aminosilicon compound, and a dye or pigment.

3,653,953

NONAQUEOUS ELECTROLESS PLATING

Louis R. Grant, Jr., Los Angeles, and Frank C. Gunderloy, Jr., Santa Susana, both of Calif., assignors to North American Rockwell Corporation

Filed Jan. 26, 1970, Ser. No. 5,918
Int. Cl. C23c *3/02*
U.S. Cl. 117—130 E **10 Claims**

A process for electroless plating of chromium, cadmium or copper wherein a salt of the metal is dissolved in a nonaque-

ous organic solvent and contacted with a catalytically active surface in the presence of a reducing agent to thereby reduce the salt and plate the surface with the metal.

3,653,954

METHOD OF COATING WITH SLOW-GELLING POLYESTER COMPOSITION

Raymond Paul Gangi, Brooklyn, N.Y., assignor to Woolsey Marine Industries, Inc.

Filed May 4, 1970, Ser. No. 34,632
Int. Cl. B44d *1/36*; C08k *1/02*
U.S. Cl. 117—132 C 7 Claims

A method is provided for formulating a resinous coating composition which can be coated onto a metallic surface for prolonged periods without gelation. By mixing a ketone with a metallic promotor and subsequently adding the product to a polyester resin composition containing a peroxide catalyst, compositions of enhanced pot life are obtained without sacrifice of any of the desired coating characteristics.

3,653,955

ANTISTATIC FIBER TREATMENTS

Emile E. Habib, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed May 20, 1968, Ser. No. 730,594
Int. Cl. C08j *1/44*; D06m *11/00*
U.S. Cl. 117—139.5 A 12 Claims

Static problems created during the processing of keratinous fibers and mixtures of fibers containing at least 10 percent by weight of keratinous fibers are minimized by applying to the fibers a conductive silicone lubricant composition containing at least about 0.2 percent by weight, based on the weight of the fibers, of a silicone lubricant. The silicone lubricant can be either a conductive or a non-conductive silicone, and supplementary antistatic additives can be included in the composition.

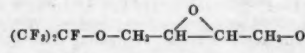
3,653,956

FLUORINATED EPOXIDES AND USE THEREOF

Allen G. Pittman, El Cerrito, and William L. Wasley, Berkeley, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture

Filed Dec. 22, 1969, Ser. No. 887,380
Int. Cl. D06m *13/68*
U.S. Cl. 117—139.5 A 7 Claims

1,4-bis-(heptafluoroisopropoxy)-2-butene is oxidized to form the corresponding epoxide



$$(CF_3)_2CF-O-CH_2-\underset{\diagdown\,O\,\diagup}{CH}-CH-CH_2-O-CF(CF_3)_2$$

This epoxide can be converted into homo- or co-polymers which are useful for enhancing the repellency of fibrous substrates, e.g., fabrics made from natural or synthetic fibers.

3,653,957

TEXTILE FIBER MATERIAL TREATED WITH A FINISHING COMPOSITION

Karl Schafer, Opladen; Friedrich Reich, Leverkusen, and Hans Schuster, Schildgen, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 18, 1968, Ser. No. 784,934
Claims priority, application Germany, Sept. 25, 1968, P 17 94 221.1
Int. Cl. B32b *27/04*; D06m *3/02*; C09d *3/60*
U.S. Cl. 117—141 3 Claims

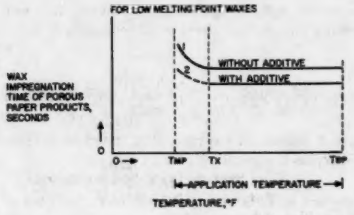
Textiles with improved handle, produced by applying a mixture of (A) a reaction product having isocyanate groups and (B) a reaction product of a hydroxy compound and an aliphatic monoisocyanate, wherein (B) can optionally be alkylated or further reacted with an isocyanate prior to mixing with (A).

3,653,958

METHOD OF DECREASING WAX IMPREGNATION TIME BY POROUS PAPER PRODUCTS

Edward M. Kohn, and Alexander D. Recchuite, both of Philadelphia, Pa., assignors to Sun Oil Company, Philadelphia, Pa.

Filed Mar. 25, 1969, Ser. No. 810,120
Int. Cl. B44d *1/09*; D21h *1/36*
U.S. Cl. 117—158 8 Claims



The rate at which a porous paper product absorbs molten paraffin waxes with a melting point less than 136° F. (AMP) is substantially increased by the addition of a small amount of an ester or mixture of esters of a fatty acid and a polyhydric alcohol to the wax before application.

3,653,959

ENCAPSULATING AND POTTING COMPOSITION AND PROCESS

Clifton L. Kehr, Silver Spring, and Walter R. Wszolek, Sykesville, both of Md., assignors to W. R. Grace & Co.

Continuation-in-part of application Ser. No. 617,801, Feb. 23, 1967, now abandoned. This application Apr. 14, 1970, Ser. No. 28,510
Int. Cl. B29c *6/00*
U.S. Cl. 117—201 8 Claims

This invention relates to encapsulating by, molding, embedding, casting, impregnating, potting and encasing various components, e.g., decorative, electric, electronic and microelectronic components using a composition which is preferably transparent comprising (1) a liquid polyene containing at least two reactive unsaturated carbon to carbon bonds per molecule and (2) a polythiol containing at least two thiol groups per molecule, the total combined functionality of (a) the reactive unsaturated carbon to carbon bonds per molecule in the polyene and (b) the thiol groups per molecule in the polythiol being greater than four, which composition, with the aforesaid components therein, can be cured under ambient conditions in the presence of a free radical generator to a solid, elastomeric or resinous product.

3,653,960

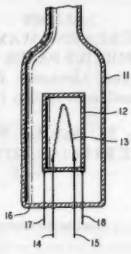
GAS LASER INCLUDING CATHODE ELEMENT

Donald MacNair, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Continuation of application Ser. No. 847,516, July 18, 1969, now abandoned, which is a continuation of application Ser. No. 568,497, July 28, 1966, now abandoned. This application Mar. 23, 1970, Ser. No. 21,854
Int. Cl. H01s *3/22*
U.S. Cl. 117—221 2 Claims

A gas laser including a cathode member comprising a

platinum containing base member having an emissive coating



deposited thereon comprising at least 90 percent barium zirconate, remainder barium oxide.

3,653,961

PAPERMAKERS FABRICS

Leonard R. Lefkowitz, Latham, N.Y., assignor to Huyck Corporation, Rensselaer, N.Y.

Filed Feb. 11, 1970, Ser. No. 10,627
Int. Cl. B32b *17/04;* **C03c** *25/02*
U.S. Cl. 117—126 GB **8 Claims**

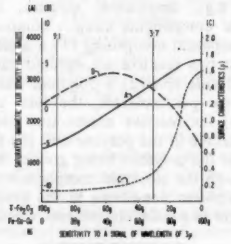
This invention relates to papermakers fabrics for use in the dryer section of papermaking machinery characterized by having bulky, resin impregnated cross-machine direction yarns.

3,653,962

MAGNETIC RECORDING MEDIUM

Goro Akashi, and Masaaki Fujiyama, both of Minami Ashigara Machi, Ashigara-Kamigum, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara-Kamigun, Kanagawa, Japan

Filed June 11, 1969, Ser. No. 832,094
Claims priority, application Japan, June 11, 1968, 43/40065
Int. Cl. H01f *10/02*
U.S. Cl. 117—240 **9 Claims**



This invention is directed to a magnetic medium of improved sensitivity and surface characteristics. The improved magnetic medium consists of a support coated thereon with a dispersion of a ferromagnetic powder being a mixture of (1) a ferromagnetic oxide powder, and (2) a ferromagnetic powder having an induction of at least 10,000 gauss, the weight ratio of (1) to (2) being from 9:1 to 3:7. Examples of (1) are γ—Fe_2O_3, Fe_3O_4 and CrO_2. Examples of (2) are Fe—Co alloy, Fe—Co—Ni alloy, Fe—Ni alloy and Co—Ni alloy.

3,653,963

METHOD FOR CLEANING STEEL WOOL PADS

Robert N. Lewis, 1556 S.E. 6th Street, and Bruce R. Cram, III, 6288 Eliott Street, both of West Linn, Oreg.

Continuation-in-part of application Ser. No. 69,162, Sept. 2, 1970, now abandoned. This application Nov. 23, 1970, Ser. No. 92,262
Int. Cl. B08b *3/00*
U.S. Cl. 134—26 **3 Claims**

A method of cleaning used steel wool pads for reuse. The method includes first washing with hot water or steam. The pad in a final treatment is immersed in an organic solvent solution of oil. The pad is then dried with oil remaining on the metallic strands thereof providing a residual protective film.

3,653,964

METHOD OF WASHING POLYAMIDE PRODUCING APPARATUS

Akira Yamamoto, and Keiichi Moriyama, both of Mihara-shi, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Nov. 10, 1969, Ser. No. 875,578
Claims priority, application Japan, Dec. 25, 1968, 43/95622
Int. Cl. B08b *3/10, 9/00*
U.S. Cl. 134—42 **4 Claims**

A method of removing a coating formed on a polyamide producing apparatus by contact with a molten polyamide, which comprises contacting the coating with a composition at a temperature not lower than 200° C., said composition consisting mainly of an ethanolamine and 0.01 to 10 percent by weight, based on said ethanolamine, of a basic substance selected from the group consisting of hydroxides of alkali metals, hydroxides of alkaline earth metals and salts of alkali metals with weak acids.

3,653,965

RECHARGEABLE GALVANIC CELL AND ELECTROLYTE THEREFOR-1

Tien Shuey Lee, Rocky River, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Oct. 16, 1970, Ser. No. 81,521
Int. Cl. H01m *41/00, 43/02*
U.S. Cl. 136—30 **6 Claims**

A rechargeable galvanic cell having a zinc anode and a zinc-containing electrolyte which comprises an aqueous alkaline or aqueous acidic medium containing dissolved zinc ions and ethylene oxide polymers or their derivatives for suppressing zinc dendrite formation during the charging cycle.

3,653,966

SEPARATOR AND HIGH ENERGY CELL HAVING AN ORGANIC CHARGE TRANSFER COMPLEX CATHODE

Kenneth R. Hill, Severna, Md., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed May 8, 1969, Ser. No. 823,182
Int. Cl. Holm *17/02;* **H01m** *3/02*
U.S. Cl. 136—83 **8 Claims**

A high energy cell employing a light metal anode and a cathode, the active material of which is a semi-conductive organic charge transfer complex. In assembly of the cell direct contact of the anode and cathode promotes formation in situ on the anode of a high resistance ionically conductive film which functions as a sefl-adjusting cell separator. Other features of the invention appear in the specification.

3,653,967

POSITIVE ELECTRO DE FOR USE IN NICKEL CADMIUM CELLS AND THE METHOD FO R PRODUCING SAME AND PRODUCTS UTILIZING SAME

Richard Lawrence Beauchamp, Madison, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 9, 1970, Ser. No. 1,885
Int. Cl. H01m *35/18*
U.S. Cl. 136—75 9 Claims

The electrolytic deposition of nickel hydroxide in a porous electrode structure is carried out within the critical temperature range of from about 85° C to the boiling point of the electrolyte, resulting in the formation of high energy density positive electrodes for alkaline nickel cadmium cells. In addition, the electrodes exhibit a high percent utilization of active material and resist flaking or shedding of the active material during formation and cell use.

3,653,968

SOLID STATE ELECTROCHEMICAL CELLS

Demetrios Vasilios Louzos, Rocky River, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed May 4, 1970, Ser. No. 34,442
Int. Cl. H01m *21/00*
U.S. Cl. 136—83 R 19 Claims

A solid state electrochemical cell having a silver or copper anode, an iodine containing cathode and an electrolyte of the general formula

$$MCN{\cdot}4A_gI$$

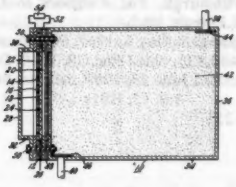
wherein M is potassium, rubidium or cesium or a mixture thereof.

3,653,969

FUEL CELL SYSTEM WITH PLURAL FUEL CELLS

William Alexander Titterington, Lynnfield; Robert White Milgate, Jr., Marblehead, and John Peter Gallagher, Burlington, all of Mass., assignors to General Electric Company

Filed May 9, 1966, Ser. No. 548,788
Int. Cl. H01m *27/14*
U.S. Cl. 136—86 C 3 Claims



A system for purging a main fuel cell of impurities comprises an auxiliary fuel cell which utilizes at least one of the streams of gas provided to the main fuel cell, which stream carries gaseous impurities downstream from the main fuel cell to the auxiliary fuel cell whereat they are trapped.

3,653,970

METHOD OF COATING SOLAR CELL WITH BOROSILICATE GLASS AND RESULTANT PRODUCT

Peter Albert Iles, Arcadia, Calif., assignor to National Aeronautics & Space Administration

Continuation of application Ser. No. 537,160, Mar. 24, 1966, now abandoned. This application Apr. 30, 1969, Ser. No. 820,453
Int. Cl. H01l *15/02, 7/32*
U.S. Cl. 136—89 18 Claims

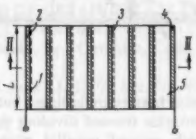
A lightweight protective glass coating over the radiation receiving surfaces of a solar cell is formed integrally with the cell by depositing a layer of glass particles to such surfaces and heating the cell and glass particles to an elevated temperature sufficient to fuse the glass particles and to form the coating. In another embodiment, a conventional protective glass slide is applied to the glass particles, prior to heating, and the cell, particles, and slide are heated to fuse the glass and form a fused glass bond between the cell and the slide.

3,653,971

SEMICONDUCTOR PHOTOELECTRIC GENERATOR

Nikolai Stepanovich Lidorenko, 3 Mytishinskaya, 14-a, kv. 127; Arkady Pavovich Landsman, Rizhsky proezd, 3, kv. 140; Dmitry Semenovich Strebkov, Luganskya, 21; Aita Konstantinovna Zaitseva, 3 Mytischinskaya ulitsa, 14, kv. 81; Vitaly Viktorovich Zadde, Moscowposelok Severny, 9 Linia 3, kv. 120, and Viktor Sergeevich Kosarev, 12 Novokuzminskaya ulitsa 4, korpus 2, kv. 2., all of Moscow, U.S.S.R.

Filed July 9, 1969, Ser. No. 840,307
Int. Cl. H01l *15/02*
U.S. Cl. 136—89 7 Claims



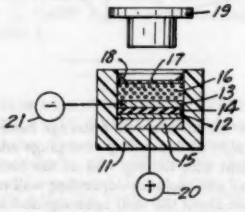
A semiconductor photoelectric generator is formed of semiconductor photoelectric converters united into a solid-state matrix, each converter having the shape of a microminiature parallelepiped and containing; an alloy region; a base region; at least one P-N junction making an angle with an operating surface of the generator exposed to radiation; a metallic conductor on at least one of said regions making the same angle with the operative surface as the P-N junction and deposited all over the parallelepiped-surface uniting the parallelepipeds of the converters into a matrix; and wherein the width of a microminiature parallelepiped is approximately equal to the diffusion length of minority carriers in said base region.

3,653,972

DISPOSABLE RESERVE CELL WITH ENCAPSULATED ELECTROLYTE

Theodore F. Bolles, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 3, 1969, Ser. No. 873,197
Int. Cl. H01m *21/10*
U.S. Cl. 136—90 5 Claims



A disposable reserve cell for the production of an electrical current in which the aqueous electrolyte is contained in a multiplicity of small capsules. The cell is activated by rupturing a substantial portion of the capsules thereby releasing the electrolyte.

3,653,973

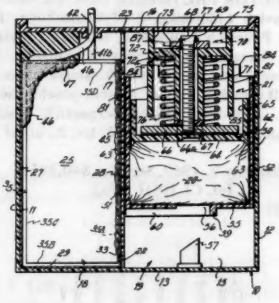
DEFERRED-ACTION BATTERY

Edward P. Broglid, Joplin, Mo., assignor to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Original application Dec. 13, 1968, Ser. No. 783,520, now Patent No. 3,516,869. Divided and this application Nov. 28, 1969, Ser. No. 882,379

Int. Cl. H01m 2/10

U.S. Cl. 136—114 4 Claims



A deferred-action battery including a battery case having a partition in the interior thereof dividing the case into a first chamber in which spaced parallel planar electrodes are disposed normal to the partition and a second chamber in which is located a rupturable electrolyte-containing sack, and including a selectively operable activating assembly for rupturing the sack and causing released electrolyte to flow from the second chamber to the first chamber and thereby activate the battery.

3,653,974

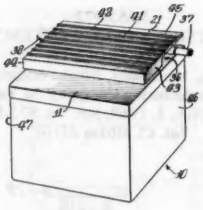
BATTERY COVER

Jerry Brosilow, Chicago, and Jack Levitt, Des Plaines, both of Ill., assignors to World Battery Corporation

Filed Apr. 15, 1970, Ser. No. 28,876

Int. Cl. H01m 1/02, 1/06

U.S. Cl. 136—170 9 Claims



A cover structure for use with a storage battery. The cover includes a plurality of depending vent plugs adapted to have fitted engagement with the top wall of the battery in the fill openings thereof and includes depending wall means for protecting the space about the vent openings and means for protectively overlying the battery terminals. Further, where the battery is provided with a data indicating means on the top wall thereof, the cover structure may include a depending wall means for protecting the space above the data indicating means. The cover includes means for facilitated manual installation and removal thereof.

3,653,975

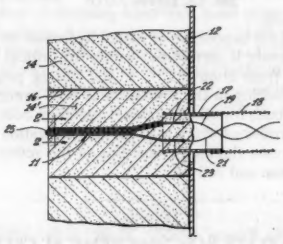
REGENERATIVE THERMOCOUPLE SENSOR

Janusz A. Stalony-Dobrzanski, Playa Del Ray, Calif., assignor to Northrop Corporation, Beverly Hills, Calif.

Filed Dec. 13, 1967, Ser. No. 690,171

Int. Cl. H01v 1/02

U.S. Cl. 136—225 1 Claim



A thermocouple device adapted to regenerate its junction in an ablating environment. The device includes a pair of dissimilar ribbon-like members the ends of which are welded or otherwise secured together. The individual members are folded on themselves in side-by-side non-contacting relation to provide a thermocouple assembly. The assembly—in turn—is imbedded in an ablating or like material. So positioned, ends of the members will reweld themselves as the ablating material melts away. The above feature is a continuous operation, rendering the operation of the device continuous.

3,653,976

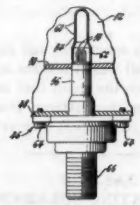
THERMOCOUPLE PROBE ASSEMBLY WITH NICKEL ALUMINIDE TIP

Donald G. Miller, Indianapolis, Ind., and Richard H. Singleton, Pittsburgh, Pa., assignors to General Motors Corporation, Detroit, Mich.

Original application May 5, 1967, Ser. No. 636,325, now Patent No. 3,486,833, dated Dec. 30, 1969. Divided and this application June 19, 1969, Ser. No. 862,096

Int. Cl. H01v 1/02

U.S. Cl. 136—231 1 Claim

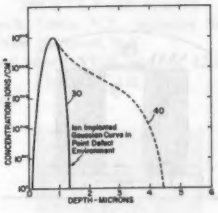


Portions of nonrotating gas turbine engine components, such as the leading edge of a turbine stator vane, fabricated of the intermetallic compound NiAl will satisfactorily resist corrosion and structural failure in operation at temperatures of 2,200–2,500° F.

3,653,977
METHOD OF PREVENTING ION CHANNELING IN CRYSTALLINE MATERIALS

Alfred J. Gale, Lexington, Mass., assignor to Ion Physics Corporation, Burlington, Mass.

Filed Apr. 10, 1968, Ser. No. 720,023
Int. Cl. H01l 7/00
U.S. Cl. 148—1.5 7 Claims



The invention discloses a method of preventing ion channelling in crystalline materials by preirradiating the material with sufficiently energetic electrons, X-rays or gamma rays to produce a sufficient density of crystal imperfections known as point defects. These defects are readily annealed away at temperatures insufficient to diffuse dopant atoms or produce a chemical or electrical effect in the material.

3,653,978
METHOD OF MAKING SEMICONDUCTOR DEVICES

David Phythian Robinson, Stanmore, Middlesex, England; Julian Robert Anthony Beale, Reigate, Surrey, England; John Martin Shannon, Redhill, Surrey, England; John Anthony Kerr, Harrow, Middlesex, England, and Mukunda Behari Das, University Park, Pa., assignors to North American Philips Co., Inc., New York, N.Y.

Filed Mar. 7, 1969, Ser. No. 805,275
Claims priority, application Great Britain, Mar. 11, 1968, 11,845/68
Int. Cl. H01l 7/54
U.S. Cl. 148—1.5 14 Claims

A method for making an IGFET is described. The method utilizes impurity ion implantation into the surface channel to determine the conductivity thereof. The advantages include special impurity profiles providing improved performance, better control over important parameters such as threshold voltage, the manufacture of improved tetrodes, and the manufacture of improved ICs using for example N- and P-channel devices, and depletion and enhancement devices combined in a single chip.

3,653,979
PROCESS FOR THE PRODUCTION OF A STEEL EXHIBITING CONSISTENTLY LOW WEIGHT LOSS TEST VALUES

Richard Wilfred Whitton, Figtree, New South Wales; Ronald Herbert Southall; Michael William McKenzie, both of Keiraville, New South Wales, and Ralph Edward Shackleford, West Wollongong, New South Wales, all of Australia, assignors to Australian Iron & Steel Pty. Limited, Sydney, New South Wales, Australia

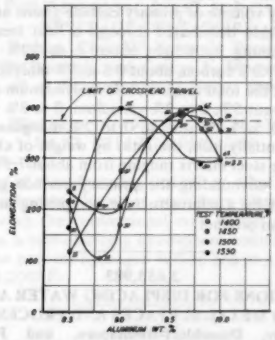
Filed July 14, 1969, Ser. No. 841,551
Claims priority, application Australia, July 25, 1968, 41211/68
Int. Cl. C23f 7/24
U.S. Cl. 148—6.24 4 Claims

Steel strip to be used in the manufacture of carbonated beverage packs is treated to incorporate sulfur into its surface layers by diffusion during the annealing cycle that is normally conducted after cold rolling and cleaning operations. The steel is first treated with an aqueous sulfide solution, dried and then heated in a conventional annealing furnace.

3,653,980
METHOD OF OBTAINING EXCEPTIONAL FORMABILITY IN ALUMINUM BRONZE ALLOYS

George H. Eichelman, Jr., Cheshire, Conn., assignor to Olin Corporation

Filed June 11, 1970, Ser. No. 45,447
Int. Cl. C22f 1/08
U.S. Cl. 148—11.5 R 17 Claims



The instant disclosure teaches a method of obtaining exceptional formability in aluminum bronze alloys comprising: providing an aluminum bronze alloy containing from 8.0 to 11.8 percent aluminum plus 0.5 to 5.0 percent iron, balance essentially copper, cold working said alloy and annealing from 1,000° to 1,400° F. and superplastically deforming at 1,400° to 1,600° F.

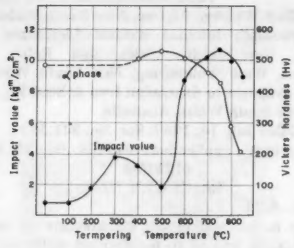
3,653,981
METHOD FOR MAKING FERRITIC STAINLESS STEEL SHEET HAVING EXCELLENT WORKABILITY

Shozo Watanabe; Takayuki Ooka; Susumu Takemura, and Mothohiko Arakawa, all of Hikari City, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Oct. 24, 1968, Ser. No. 770,341
Int. Cl. C21d 1/32, 9/48
U.S. Cl. 148—12.4 3 Claims

A method for making a ferritic stainless steel having an excellent workability, particularly bending workability and producing almost no ridgings, comprising annealing a hot-rolled steel band at a high temperature above 900° C.,

quenching the annealed steel band to form a martensite, then quenching the steel to a temperature below 760° C. so that



the martensite with not be decomposed and thereafter subjecting the steel to conventional cold-rolling and annealing.

3,653,982

TEMPER RESISTANT CHROMIUM-CONTAINING TITANIUM CARBIDE TOOL STEEL

Arnold Louis Prill, Suffern, N.Y., assignor to Chromalloy American Corporation, West Nyack, N.Y.

Filed Dec. 18, 1969, Ser. No. 886,286

Int. Cl. C22c *39/14*; B22f *3/24*

U.S. Cl. 148—31 **4 Claims**

A heat treatable, temper resistant, chromium-containing, carbidic tool steel having a total carbon content of at least about 6 percent by weight is provided comprising about 25 to 75 percent by volume of primary carbide grains of essentially titanium carbide distributed through a heat treatable steel matrix containing by weight about 6 to 12% chromium, about 0.6 to 1.2% carbon, about 0.5 to 5% molybdenum, 0 to 5% tungsten, the total tungsten and molybdenum content not exceeding about 5%, 0 to 2% vanadium, 0 to 3% nickel, 0 to 5% cobalt, 0 to 1.5% silicon, 0 to 2% manganese and the balance essentially iron, the ratio by weight of chromium to carbon in the steel matrix ranging from about 7:1 to 25:1, the steel matrix surrounding the primary carbide grains being characterized by a microstructure comprising an austenitic decomposition product.

3,653,983

COMPOSITIONS FOR DISPLACING WATER ADHERING TO METAL SURFACES AND PROCESS

Georg Ziehr, Dusseldorf-Holthausen, and Heinz-Dieter Heidenbluth, Dusseldorf, both of Germany, assignors to Henkel & Cie GmbH, Dusseldorf-Holthausen, Germany

Filed Nov. 13, 1969, Ser. No. 876,604

Claims priority, application Germany, Nov. 22, 1968, P 18 10 245.9

Int. Cl. B01d *12/00*

U.S. Cl. 148—6.14 R **8 Claims**

A composition for the displacing of an aqueous film or layer adhering to a metal surface consisting essentially of an organic water-immiscible solvent selected from the group consisting of an organic water-immiscible solvent having a density of less than 0.9 gm./ml. and a mixture of miscible organic water-immiscible solvents, said mixture having a density of less than 0.9 gm./ml., containing from 0.1 to 10 percent of an acid selected from the group consisting of monocarboxylic acid having from seven to 12 carbon atoms and mixtures of monocarboxylic acids having an average of from seven to 12 carbon atoms and from 0.1 to 8 percent of an alkylamine selected from the group consisting of alkylamines having from six to 10 carbon atoms and mixtures of alkylamines having an average of from six to 10 carbon atoms, the average sum of the carbon atoms in said acid and said alkylamine being from 15 to 17; as well as the process of removing adhering liquid utilizing said composition.

3,653,984

METHOD FOR ANNEALING SILICON STEEL STRIP FOR USE AS MATERIAL OF ELECTRIC MACHINERY

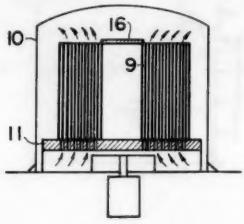
Nobuo Urushiyama; Minoru Yosho, and Takamitu Miyata, all of Kitakyushu City, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Apr. 28, 1969, Ser. No. 819,876

Claims priority, application Japan, Apr. 30, 1968, 43/28888

Int. Cl. H01f *1/18*

U.S. Cl. 148—113 **9 Claims**



Method for annealing silicon steel strip which has been coated with a slurry of such metal-hydroxides as are capable of forming a glassy film on the surface of said silicon steel strip, which has been wound into a coil, and which has been annealed in the desired atmosphere, thereby contracting the volume of the so applied metal-hydroxides, so as to produce a space between coil-layers.

3,653,985

PROCESS FOR THE MANUFACTURE OF A BAND SAW

Toshiei Funakubo, 3-19, Fukagawa Takabashi, Koto-ku, Tokyo, Japan

Filed Dec. 3, 1969, Ser. No. 881,845

Claims priority, application Japan, Dec. 9, 1968, 43/89531

Int. Cl. C21d *9/24*

U.S. Cl. 148—127 **4 Claims**

A novel process for the manufacture of a metal- or wood-cutting band saw having a uniform structure and mechanical strength and sufficiently flexible to pass over two wheels on a conventional sawing equipment without breaking along the line of weld in the course of metal- or wood-cutting operations.

For the manufacture of such a band saw, a series of saw teeth are formed on one edge of cutting edge of an elongated steel band adapted for serving as a band saw. The steel band is then cut to a predetermined length and the cut material is welded at the two ends directly without any solder therebetween. The steel band saw is then quenched and tempered as a whole to obtain an even temper, and the front or cutting edge of the band is quenched and tempered as usual for hardening the saw teeth.

3,653,986

METHOD FOR CONTROLLING THE EDDY-CURRENT LOSS AND INCREASING THE PERMEABILITY OF MAGNETIC ALLOYS

Vernon J. Pingel, Arlington Heights, Ill., assignor to Western Electric Company, Incorporated, New York, N.Y.

Continuation-in-part of application Ser. No. 733,333, May 31, 1968, now abandoned. This application June 27, 1969, Ser. No. 842,780

Int. Cl. H01f *1/24*; C22c *19/00*

U.S. Cl. 148—104 **9 Claims**

A method of controlling the eddy-current loss and increasing the permeability of sulfur-and-manganese-bearing, 2–81 Molybdenum Permalloy, pressed powder by maintaining the alloy at an elevated temperature in an air or other environ-

ment for a sufficient time to begin nucleation of a solid-solution precipitate which is evenly distributed within the grains of the alloy, but without permitting significant growth and combination of the precipitate into large particles or their migration to the grain boundaries, and annealing in a reducing atmosphere for a period of time sufficient to cause secondary recrystallization of the grains and dissolve the solid-solution precipitate.

3,653,987

NICKEL BASE ALLOY

William J. Boesch, Utica, N.Y., assignor to Special Metals Corporation, New Hartford, N.Y.

Filed June 1, 1970, Ser. No. 42,412
Int. Cl. C22f 1/10
U.S. Cl. 148—162 **7 Claims**

A nickel base alloy consisting essentially of, in weight percent, up to 0.18% carbon, from 14.2 to 20% cobalt, from 13.7 to 16% chromium, from 3.8 to 5.5% molybdenum, from 2.75 to 3.75% titanium, from 3.75 to 4.75% aluminum, up to 4% iron, from 0.005 to 0.035% boron, up to 0.5% zirconium, up to 0.5% hafnium, up to 0.75% columbium, up to 0.5% rhenium, up to 0.75% tantalum, up to 1.0% manganese, up to 3% tungsten, up to 0.5% rare earth metals, balance essentially nickel with incidental impurities and having a morphology comprised of gamma prime particles which consist essentially of randomly dispersed irregularly shaped particles less than about 0.35 micron.

A method of treating an alloy consisting essentially of, in weight percent, up to 0.18% carbon, from 14.2 to 20% cobalt, from 13.7 to 16% chromium, from 3.8 to 5.5% molybdenum, from 2.75 to 3.75% titanium, from 3.75 to 4.75% aluminum, up to 4% iron, from 0.005 to 0.035% boron, up to 0.5% zirconium, up to 0.5% hafnium, up to 0.75% columbium, up to 0.5% rhenium, up to 0.75% tantalum, up to 1.0% manganese, up to 3% tungsten, up to 0.5% rare earth metals, balance essentially nickel with incidental impurities, to develop a morphology comprised of gamma prime particles which consist essentially of randomly dispersed irregularly shaped particles less than about 0.35 micron in diameter. It comprises the steps of heating the alloy at a temperature of at least about 2,000° F., cooling the alloy and heating the alloy at a temperature of from about 1,500° F. to about 1,850° F.

3,653,988

METHOD OF FORMING MONOLITHIC SEMICONDUCTOR INTEGRATED CIRCUIT DEVICES

Vincent J. Glinski, Murray Hill, and Bernard T. Murphy, New Providence, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Continuation-in-part of application Ser. No. 703,165, Feb. 5, 1968, now abandoned. This application Apr. 3, 1969, Ser. No. 820,697
Int. Cl. H01l 7/44, 3/00; B01j 17/00
U.S. Cl. 148—175 **7 Claims**

This method of fabricating junction-isolated semiconductor integrated circuit devices eliminates the photolithographic masking operation associated with a base diffusion by performing a non-selective P-type base diffusion into the entire surface of a thin N-type epitaxial layer. The lateral extent of base zones and resistor zones is defined by selectively

diffusing low resistivity N-type deep contact zones completely through the epitaxial layer to intersect the entire perimeter of a buried N-layer. Junction isolation, consisting of either back-to-back diodes or junction field-effect transistors, may be used.

3,653,989

ZN DIFFUSION INTO GAP

Alois Erhard Widmer, Wuerenlos, Switzerland, assignor to RCA Corporation

Filed Apr. 2, 1970, Ser. No. 25,225
Int. Cl. H01l 7/44
U.S. Cl. 148—189 **8 Claims**

Zinc is diffused into N type gallium phosphide to form a PN junction therein. The zinc diffusion takes place in vacuum at temperatures between about 800°–950° C. from a ZnP_x source.

3,653,990

METHOD FOR IMPROVING STEEL FOR CARBONATED BEVERAGE CONTAINERS

Robert M. Hudson, Churchill Borough; Dorald W. Stoner, Monroeville Borough, and George L. Stragand, Elizabeth Borough, all of Pa., assignors to United States Steel Corporation

Filed Mar. 18, 1970, Ser. No. 20,836
Int. Cl. C21d 7/14, 9/46, 1/00
U.S. Cl. 148—12.1 **9 Claims**

A method of manufacturing tinplate or other coated sheet steels for carbonated beverage containers wherein the sheet steel, following the conventional cold rolling procedure, is annealed in a non-oxidizing atmosphere containing at least 0.10 volume percent hydrogen sulfide and at a temperature of at least 1,200° F.

3,653,991

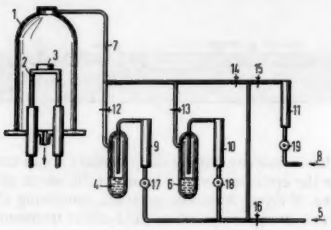
METHOD OF PRODUCING EPITACTIC GROWTH LAYERS OF SEMICONDUCTOR MATERIAL FOR ELECTRICAL COMPONENTS

Erhard Sirtl, Midland, Mich., and Hartmut Seiter, Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany

Filed June 16, 1969, Ser. No. 833,818
Claims priority, application Germany, June 14, 1968, P 17 69 605.8
Int. Cl. H01l 7/36
U.S. Cl. 148—175 **5 Claims**

Homogeneous epitactic growth layers of semiconductor material for electrical components, particularly for integrated circuit, having locally separated regions situated on a crystal wafer, by pyrolitic dissociation of a gaseous compound of the semiconductor material and by precipitating said semiconductor material upon a heated, monocrystalline carrier body which is coated at specific regions of its surface with a masking layer. The method is characterized by the fact that both bromine and hydrogen are included in the reaction gas, shifting the equilibrium of the reaction partners through development of additional hydrogen halide, during the precipitation process at the heated carrier body. Thus precipitation of the semiconductor material, occurs only at the places of the car-

rier body, not coated with the masking layer, while no semiconductor material is precipitated at the regions of the



carrier body which are coated with the masking layer, due to a suppression of the heterogenic seed formation.

3,653,992

AQUEOUS SLURRY SALT TYPE EXPLOSIVES CONTAINING NITRATO-ALKANOL AS SENSITIZER COMPONENT AND MANUFACTURE THEREOF

Harry R. Fee, Hopatcong, and Eldon K. Hurley, Wharton, both of N.J., assignors to Hercules Incorporated, Wilmington, Del.

Filed Mar. 5, 1970, Ser. No. 16,939
Int. Cl. C06b *19/00*

U.S. Cl. 149—2 **28 Claims**

Aqueous slurry salt type explosives containing, as a sensitizer component, a nitrato-alkanol, soluble, and dissolved, in sensitizing amount in the aqueous solution phase.

An aqueous solution phase for explosives of the invention and containing the nitrato-alkanol formed in situ, is provided by reacting a suitable epoxide with aqueous excess HNO_3 to form the nitrato-alkanol, and then neutralizing the excess HNO_3 to form a resulting aqueous salt and nitrato-alkanol product solution, as said aqueous solution phase; and, in a separate embodiment, admixing the remaining ingredients for the explosive with the entire aqueous product solution, to form the slurry explosive product. The nitrato-alkanol, in each method embodiment, is formed and handled without need for isolation of same; and excess HNO_3, which enhances equilibrium of the nitrato-alkanol-forming reaction is readily removed by the neutralization which concomitantly provides in situ formation of the salt for incorporation into the explosive product without need for associated separation or isolation steps.

3,653,993

SMOKELESS PROPELLENT COMPOSITIONS CONTAINING POLYESTER RESIN

George W. Batchelder, Yucaipa, and Gilbert A. Zimmerman, Monrovia, both of Calif., assignors to Aerojet-General Corporation, Azusa, Calif.

Filed June 12, 1956, Ser. No. 590,998
Int. Cl. C06d *5/06*

U.S. Cl. 149—19 **17 Claims**

1. Method for producing thrust in the absence of smoke, said method comprising burning a propellant composition consisting essentially of a cured intimate mixture of a solid nonmetallic, inorganic oxidizing salt in amount from about 45 to about 90 percent by weight of the total propellant composition, a combustible organic resin, a catalytically effective quantity of a burning rate acceleration catalyst selected from the group consisting of the nitrate salts of zinc, lithium, iron, chromium, and mixtures thereof so as to produce nonsmoking gases, and exhausting said gases through an orifice to produce thrust.

3,653,994

PROPELLANT COMPOSITIONS CONTAINING A METAL NITRITE BURNING RATE CATALYST

George W. Batchelder, Glendora, and Gilbert A. Zimmerman, Monrovia, both of Calif., assignors to Aerojet-General Corporation, Azusa, Calif.

Filed May 24, 1954, Ser. No. 432,014
Int. Cl. C06d *5/06*

U.S. Cl. 149—19 **7 Claims**

1. A solid propellant composition consisting essentially of a cured intimate mixture of from about 50 percent to about 80 percent by weight of the total propellant composition of an ammonium salt selected from the group consisting of ammonium chlorate, perchlorate and nitrate and unsaturated polyester resin consisting of the condensation product of saturated polyhydric alcohol and polycarboxylic acid heteropolymerized with an unsaturated compound selected from the group consisting of lower alkenes, lower alkynes, phenyl substituted lower alkenes, lower alkyl dienes, lower alkenyl esters of lower alkanoic acids, lower alkyl esters of lower alkenoic acids, lower alkenyl esters of lower alkenoic acids, allyl diglycol carbonate, diallyl diglycollate, and mixtures thereof; from 0 percent to about 2 percent by weight ammonium dichromate and from about 0.5 percent to about 5 percent by weight of a burning rate acceleration catalyst selected from the group consisting of potassium nitrite, barium nitrite, calcium nitrite and mixtures thereof.

3,653,995

INCENDIARY COMPOSITION

Edward G. Selleck, San Diego; Alfred F. Weinberg, El Cajon, and Geoffrey R. Tully, Jr., Poway, all of Calif., assignors to Gulf Oil Corporation, San Diego, Calif.

Filed Mar. 26, 1969, Ser. No. 810,804
Int. Cl. C06d *1/02*

U.S. Cl. 149—19 **7 Claims**

A pyrophoric powder made of an alloy of misch metal having a particle size distribution making it particularly suitable for employment in an airborne incendiary device in combination with an organic binder that serves to initiate oxidation and as an oxidizer. Incendiary devices using the powder dispersion exhibit prompt and sure ignition followed by the formation of a clinker with uniform and slow secondary burning properties.

3,653,996

CONTROLLED GELATION IN AQUEOUS EXPLOSIVES CONTAINING BORIC ACID

Donald W. Edwards, Lehighton, Pa., assignor to Atlas Chemical Industries, Inc., Wilmington, Del.

Filed Jan. 22, 1970, Ser. No. 5,144
Int. Cl. C06b *19/04*

U.S. Cl. 149—21 **27 Claims**

Explosive compositions containing boric acid, a gelling agent, an oxidizer, a fuel component, and an aqueous medium and a method of controlling the degree of gelation of these compositions. The compositions can be gelled to the extent desired by adjusting their pH.

3,653,997

CONDITIONING AND SHAPING SOLUTION FOR CIRCUIT BOARDS

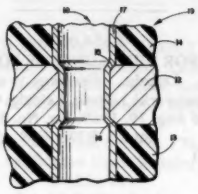
Bill F. Rothschild, Whittier; Fredrick C. Seymour, Downey, and Jon G. Thomas, Anaheim, all of Calif., assignors to North American Rockwell Corporation

Filed June 22, 1970, Ser. No. 48,247
Int. Cl. C23f *1/02*; C09k *3/00*

U.S. Cl. 156—3 **8 Claims**

A preferred solution of sodium dichromate, sulfuric acid, and orthophosphoric acid maintained at a pH of less than

one is used to etch away sharp edges (burrs) remaining after



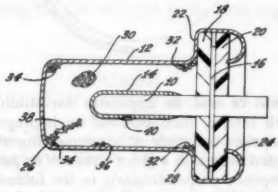
a copper clad epoxy-glass laminate has been drilled and to condition the epoxy glass for metal deposition.

3,653,998

ELECTROLYTIC CELL ETCHING

James P. Sandstrom, Marina Del Rey, Calif., assignor to The Bissett-Berman Corporation, Santa Monica, Calif.

Filed Aug. 21, 1968, Ser. No. 754,277
Int. Cl. C23f 1/04; H05k 3/06
U.S. Cl. 156—6 **5 Claims**



The present invention relates to the manufacture of electrolytic cells. Specifically, the invention relates to the manufacture of electrolytic cells which do not prematurely short out and which do not provide false readings upon a readout of the information stored in the cell. The electrolytic cells include an inner conductor which is plated with an active material and wherein the active material is plated on the inner conductor using a waterless plating solution and wherein the actual plating occurs at a temperature substantially lower than room temperature, for example, 5° ± 5° C. The waterless plating solution can be a solution of silver nitrate in dimethylsulfoxide. The invention also includes the use of an outer cup electrode which receives the inner electrode and wherein the outer cup electrode is treated to remove strain within the cup electrode. The treatment by thermally etching the cup electrode to remove the strain and at the same time eliminate surface contaminations. As a final step to the construction of the electrolytic cell and after the inner electrode is sealed across an open end of the cup electrode the electrolytic cell is subjected to an elevated temperature substantially above room temperature so as to cure the electrolytic cell and create a condition of equilibrium within the electrolytic cell.

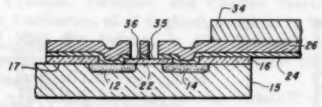
3,653,999

METHOD OF FORMING BEAM LEADS ON SEMICONDUCTOR DEVICES AND INTEGRATED CIRCUITS

Clyde Rhea Fuller, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 25, 1970, Ser. No. 75,635
Int. Cl. H01l 7/50; H05k 1/04
U.S. Cl. 156—11 **6 Claims**

Disclosed is an improved method for forming corrosion resistant beam lead connectors on semiconductor devices such as integrated circuits. A barrier layer of a titanium and tungsten alloy is deposited over the surface of the integrated circuit. A layer of gold is then deposited over the barrier layer. The layer of gold is patterned to define interconnection paths between the various devices of the integrated circuit and beam lead connection geometries, using photoresist and a gold etchant. The titanium-tungsten barrier layer is left intact during this step. The photoresist pattern is removed and a second pattern is applied to cover all areas of the integrated



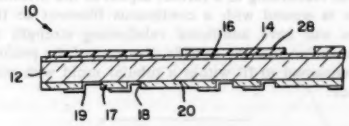
circuit except those areas where beam leads are desired. An additional layer of gold is plated to the appropriate thickness to form the beam leads, the photoresist pattern effecting a plating stop-off and the titanium-tungsten layer providing electrical continuity across the slice. Electrical separation between beam lead connectors and device interconnection paths is effected by etching the titanium-tungsten alloy with an etchant that attacks only the alloy, leaving the gold geometries intact.

3,654,000

SEPARATING AND MAINTAINING ORIGINAL DICE POSITION IN A WAFER

Raymond P. Totah; Gordon L. Hawkins, both of Costa Mesa; Peter H. Soo, Huntington Beach, and George Wolfe, Jr., Newport Beach, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 18, 1969, Ser. No. 817,440
Int. Cl. H01l 7/50
U.S. Cl. 156—17 **5 Claims**



A wafer of silicon material containing semiconductor devices on its front side has an oxide coating on its back side. The back side is masked and aligned in conformity with the devices on the front side. The oxide is selectively etched and the remaining oxide serves as a mask for etching through the semiconductor material. The devices are retained in relative position throughout the separation steps.

3,654,001

PROCESS FOR ETCHING BERYLLIUM

Howard G. Mann, Seal Beach, Calif., assignor to North American Rockwell Corporation

Filed June 25, 1968, Ser. No. 739,648
Int. Cl. C23f 1/00
U.S. Cl. 156—18 **8 Claims**

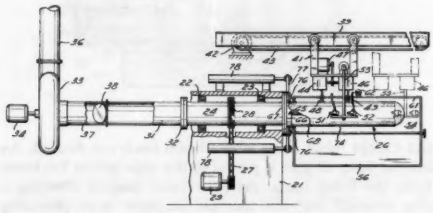
A process for chemical milling of beryllium and high beryllium alloys is described wherein the beryllium is subjected to an aqueous solution of an acid selected from the group consisting of sulfuric acid, oxalic acid, and ammonium acid fluoride plus sufficient hexavalent chromium ion to prevent channeling. In a preferred embodiment sulfuric acid is present in the range of 5–15 percent chromium ion is present in the range of 7–10 percent CrO_3; sodium nitrate is present up to about 1.3 percent; and hydrofluoric acid is present up to about 2 percent.

3,654,002

FIBER PREFORM AND METHOD AND APPARATUS FOR MAKING SAME

Arthur J. Wiltshire; Henry U. Ranallo, both of Cleveland, and Frank E. Czumber, Chardon, all of Ohio, assignors to Structural Fibers, Inc., Chardon, Ohio

Filed July 5, 1968, Ser. No. 742,692
Int. Cl. B29j *1/02;* **D21j** *5/00*
U.S. Cl. 156—62.4 **8 Claims**



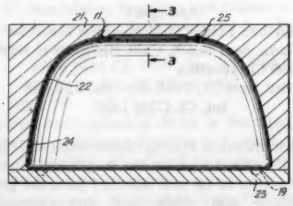
A preform suitable for the bag molding of fiber glass articles such as tanks or the like is disclosed. The preform includes a tubular portion and an integrally formed end wall at one end. The wall of the preform consists of a mat formed by a multitude of short lengths of fibers randomly oriented in the wall and bonded by a setable resin which does not fill the voids between the fibers. The form is free of overlaps and seams. A machine and a method for forming this preform is also disclosed. The machine includes a perforated form rotated about its longitudinal axis while vacuum is applied internally. Choppers deposit short lengths of fibers on the rotating form and resin is sprayed onto the fibers as they are deposited. An oven is provided to cure the resin while the preform remains on the form. Power means are provided to remove the preform from the machine. Because the form is rotating while the cutters traverse the length to deposit the fibers, the dominant orientation of the fibers is in a spiral direction. According to a further aspect of the invention, the preform is wound with a continuous filament so that the preform will have additional reinforcing strength characteristics and so that the outside diameter of the preform will be dimensioned to fit within a tubular mold with minimum clearance.

3,654,003

METHOD OF MOLDING HOLLOW ARTICLE WITH MOLDED-IN FASTENER

Morris Gary Grossman, Wyckoff, N.J., assignor to Peter's Bag Corporation, New York, N.Y.

Filed May 14, 1969, Ser. No. 824,508
Int. Cl. B32b *1/04*
U.S. Cl. 156—66 **6 Claims**



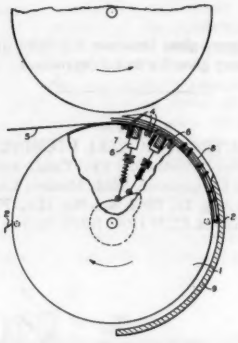
A method for molding a fastener, such as a zipper, or other material, device or attachment into a hollow article such as a bag for making the fastener or device an integral part of the bag while protecting the fastener elements during the molding operation. The technique of the invention is especially suitable where the bag or other article is formed by the technique of roto-molding.

3,654,004

APPARATUS FOR THREADING OF FOLDING SHEETS

Fritz Piesche, Leipzig, Germany, assignor to Veb Druckmaschinenwerke Leipzig, Leipzig, Germany

Filed Aug. 19, 1969, Ser. No. 851,382
Int. Cl. B32b *7/08*
U.S. Cl. 156—91 **3 Claims**



A method of and an apparatus for stitching of folded sheets with textile, thermoplastic or impregnated threads, which comprises the steps of accompanying of continuously moved folded sheets for a given stroke of its path by stitching needles disposed perpendicularly to the folded sheets at the same speed and in the same direction. The folded sheets are thereby relatively stationary with respect to the stitching needles during the insertion of ends or loops of threads. The thread ends or loops pass a stationary sealing rail or gluing device and are sealed or glued by the latter.

3,654,005

BONDING GLASS WITH THERMOPLASTIC SEALING COMPOSITIONS

John J. Higgins, Westfield; Anthony J. Berejka, Cranford, and Lawrence Spenadel, Westfield, all of N.J., assignors to Esso Research and Engineering Company

Filed July 19, 1968, Ser. No. 745,997
Int. Cl. C09j *3/14;* **B29c** *27/06*
U.S. Cl. 156—108 **47 Claims**

A process of sealing window glass including preparing a thermoplastic sealing tape of either a) butyl rubber or halogenated butyl rubber with a thermoplastic material and a tackifier, or b) EPDM or EPM rubber with a tackifier, inserting the tape in a window frame, heating the tape to soften it, and inserting the window glass.

3,654,006

METHOD OF PRODUCING PACKAGING MATERIAL

William C. Heller, Jr., 3521 N. Shepard Ave., Milwaukee, Wis., and Donald W. Davis, 7038 N. Beach Road, Milwaukee, Wis.

Continuation of application Ser. No. 531,899, Mar. 4, 1966, now abandoned. This application Oct. 29, 1969, Ser. No. 872,079
Int. Cl. B32b *31/10*
U.S. Cl. 156—108 **10 Claims**

A method of producing paperboard, or like, containers having coated window openings therein for viewing the contents. Window openings are formed in a base sheet and covered by a transparent window sheet. The window sheet

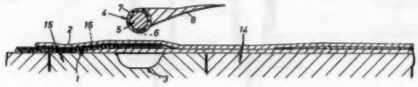
and base sheet are then coated with a layer of film forming material to complete the production process.

3,654,007

METHOD OF FOLDING FABRIC ABOUT A TIRE BEAD

Roy D. J. Winstanley, Birmingham; Alfred H. Grossett, Lichfield, and Wilfred H. Harrington, Solihull, all of England, assignors to Dunlop Holdings Limited, London, England

Filed Nov. 22, 1968, Ser. No. 778,245
Claims priority, application Great Britain, Dec. 1, 1967, 54,826/67
Int. Cl. B29h *17/22*
U.S. Cl. 156—132 **7 Claims**



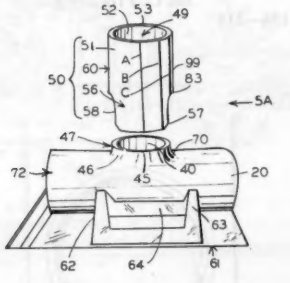
A method of reducing distortion of the steel cords of a radial ply carcass of a pneumatic tire provided with a bias laid filler strip in the bead region of the tire, during the turn-up of the carcass and the filler strip about the tire bead comprising lubricating the tire elements in the bead region of the tire.

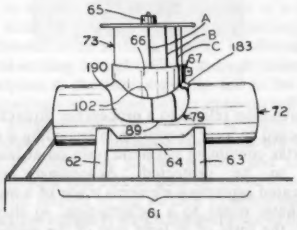
3,654,008

MANUFACTURE OF A PROCESS OF A PLASTIC T-ASSEMBLY

Frank J. Rogers, Waka, and Joe MacClose, Spearman, both of Tex., assignors to Rogers Sales & Service, Inc., Waka, Tex.

Continuation-in-part of application Ser. No. 831,814, May 22, 1969. This application July 15, 1970, Ser. No. 55,113
Int. Cl. B32b *31/14*
U.S. Cl. 156—152 **6 Claims**





Process of manufacture of a plastic T-assembly comprising a conduit with sput unit in combination with a shaped stem unit, wherein the conduit and sput unit is used as a mold and a part of the stem is utilized as a positioning device for forming a closely mating saddle surface portion on the stem unit between and joining the stem unit and the conduit and sput unit.

3,654,009

PRESSURE VESSELS

Nigel Cecil William Judd, Sandhurst, Camberley; Thomas Lloyd, Crondall, Farnham, and Charles Trevor Mann, Frimley, Camberley, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Feb. 11, 1969, Ser. No. 798,447
Int. Cl. B65h *54/64*
U.S. Cl. 156—155 **3 Claims**

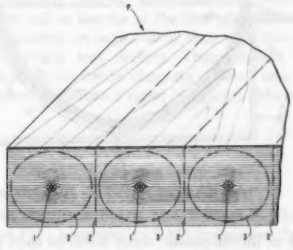
Pressure vessels are formed on a hollow aluminum mandrel having an external surface of a configuration corresponding to the desired internal shape of the vessels. An impervious vessel inner liner is formed on the mandrel as by electrodeposition, and the vessel wall is then formed by winding filamentary reinforcing material on the inner lining, impregnating such material with a resinous material, curing the resinous material, and then removing the hollow aluminum mandrel chemically by use of an aqueous solution of caustic soda.

3,654,010

METHOD OF MAKING GYMNASTIC BARS OF LAMINATED WOOD

Bernhard Hausmann, Blomberg/Lippe, Germany, assignor to Blomberger Holzindustrie B. Hausmann KG, Blomberg/Lippe, Germany

Filed Apr. 16, 1969, Ser. No. 816,670
Claims priority, application Germany, Apr. 16, 1968, P 17 03 197.9
Int. Cl. B32b *21/00, 31/10, 31/18*
U.S. Cl. 156—178 **7 Claims**



A method of making slender rods, such as gymnastic bars of laminated wood with an internal, longitudinally extending insert, wherein the latter is pressed into the wooden body during the making thereof by bonding together a plurality of wood sheets under heat and pressure.

3,654,011

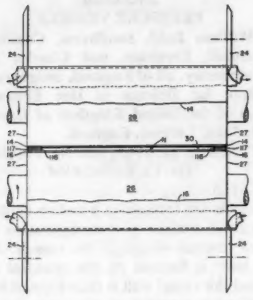
METHOD OF MANUFACTURING MAGNETIC BELTS

Roland N. Buteau, Westbrook, and Ruel E. Taylor, Jr., West Buxton, both of Maine, assignors to Scott Paper Company, Delaware County, Pa.

Filed Apr. 17, 1969, Ser. No. 817,059
Int. Cl. B31f *5/00*
U.S. Cl. 156—204 **5 Claims**

A magnetic belt manufacturing apparatus wherein two continuous webs of magnetic recording material are unwound at equal speeds, and fed into a splicing nip with their

longitudinal edges coincident and non-recording sides opposed. Two rolls of pressure sensitive tape are unwound at a speed equal to the web unwind speed, passed through creasing and folding nips, and introduced into the splicing nip between the non-recording sides of the webs with their



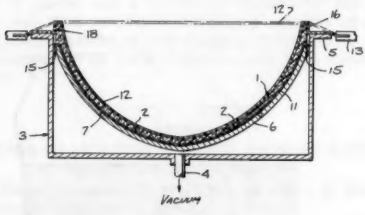
folded center-lines coincident with the web edges and their exposed adhesive sides extending inwardly from the edges. The flattened tubular web emerging from the splicing nip is cut into a plurality of magnetic recording belts which are conveyed to a packaging station.

3,654,012

METHOD OF MAKING A COMPOSITE PLASTIC ARTICLE OF MANUFACTURE

Wilfred C. Schlager, Chicago, Ill., assignor to Uniroyal Inc., New York, N.Y.

Filed Feb. 4, 1970, Ser. No. 8,524
Int. Cl. B29c *17/00*
U.S. Cl. 156—212 **8 Claims**



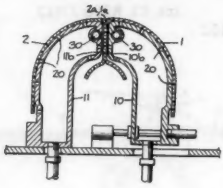
A layer of thermoplastic sheet material such as sheet ABS is heated to a temperature at which it is thermally formable and while at this temperature is thermally formed, as by differential gas forming, typically vacuum forming, against a shaped body of cellular thermoplastic material such as expanded polystyrene. As a result of the heat in the sheet as it is drawn against the cellular body which is at room temperature, fusion welding of the sheet to the surface of the cellular body at the interface takes place. No cement or other adhesive, organic solvent or the like is used. The result is that the cellular body is protected against puncturing, shattering under impact, abrasion, and other physical influences that would normally tend to injure it and is made much stronger. The disadvantages of prior attempts to make such composites, such as the need for preforming the sheet and then bonding it to the body and the need to use solvent-based cements or organic solvents, are completely obviated. The invention is exemplified by the manufacture of a boat having an expanded polystyrene core and layers of sheet ABS covering and fusion welded to its interior and exterior surfaces.

3,654,013

METHOD OF MAKING A FORMED AND BONDED PLASTIC SHEET STRUCTURE

Douglas A. Willsie, Waterloo; Ronald D. Habel, Kitchener, and Robert D. Shepherd, Waterloo, all of Canada, assignors to Uniroyal, Inc., New York, N.Y.

Filed Apr. 14, 1969, Ser. No. 815,999
Int. Cl. B29c *27/02*; **C29c** *7/00*
U.S. Cl. 156—212 **21 Claims**



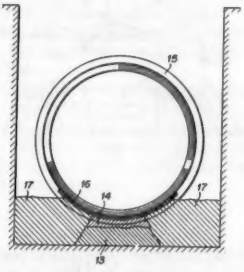
A composite plastic structure is formed by heating a pair of heat formable plastic sheets to heat formable temperature, independently shaping the heated sheets on a pair of cooperating spaced mold members, moving the mold members together so as to place in contact therebetween sealed heat fusible portions of the sheets located between the mold members, and locally heating the contacting portions of the sheets so as to fuse the latter together.

3,654,014

PROCESS FOR PROTECTING A WALL SUBJECTED TO WEAR

Charles Merminod, Geneva, Switzerland, assignor to Societe Anonyme Conrad Zschokke, Geneva, Switzerland

Filed June 18, 1969, Ser. No. 834,371
Claims priority, application Switzerland, July 5, 1968, 10122/68
Int. Cl. F16l *55/18*
U.S. Cl. 156—215 **13 Claims**

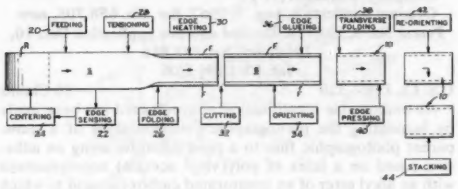


This invention relates to a process for protecting a non-flat wall exposed to wear consisting in providing a coating made of a mortar containing synthetic resin on at least part of the surface to be protected. Accordingly one subjects prefabricated protective elements made of a mortar containing synthetic resins to a deformation, so that they adjust better to the form of at least part of the surface to be protected, one fastens these elements to said surface and one points flat the joints of adjacent coating elements.

3,654,015
METHOD OF MAKING PILLOW CASES

Rupert M. Purcell, 1310 Spencer Ave., San Jose, Calif., and David S. Bartlett, Jr., Sierra Road, Route 2, Box 836, San Jose, Calif.

Filed Nov. 5, 1968, Ser. No. 773,414
Int. Cl. B29d *23/10*
U.S. Cl. 156—217 **9 Claims**

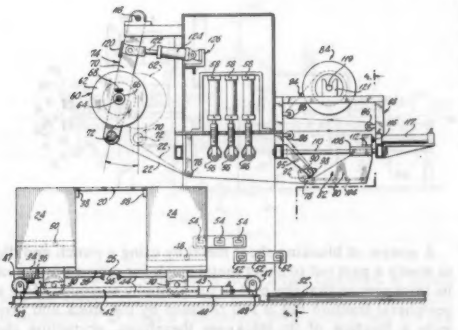


A pillow case formed from thin, non-woven fabric, initially taking the form of an elongated strip which is continuously fed, inwardly folded at its moving edges, then transversely cut whereupon glue is supplied to the edges of the resultant blank which is subsequently transversely folded to bring the glued edges into adherent relationship to form the finished pillow case.

3,654,016
METHOD AND APPARATUS FOR ADHERING FOIL TO A SURFACE

Martin J. Alexander, Tenafly, N.J., assignor to Admiral Coated Products, Inc.

Filed Oct. 8, 1969, Ser. No. 864,845
Int. Cl. B32b *31/08, 31/20*
U.S. Cl. 156—247 **8 Claims**

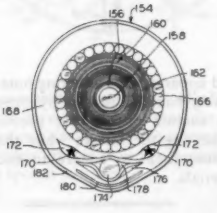


A method and apparatus for adhering foil to a given surface. The foil is initially supported at one face of a flexible carrier which must be stripped from the foil subsequent to the adhering thereof to the surface. The foil is adhered to the surface by heat-ironing brought about through suitable rollers, and subsequent to the adhering of the foil to the surface the carrier is continuously wound onto a stake-up roll so that the carrier is progressively from the foil to carry out the stripping operations. These stripping operations are brought about in part by movement of the surface and foil with respect to a stripping roll and in part by movement of the stripping roll with respect to the surface to which the foil is adhered, so that the extent to which the surface and foil must be fed is diminished by the extent to which the stripping roll is moved with respect to the surface and the foil adhering thereto. Also the carrier and foil are derived from a supply roll supported on a swingable frame which moves the supply roll from a given starting position to a given end position during the adhering of the foil to the surface, and a return structure returns the swingable frame back to its starting position after the operations are completed, so that in this way the edge of the foil which is first displaced toward the surface is backed up from the region of the last of the series of heat-ironing rollers to the region of the first thereof, thus reducing waste of foil.

3,654,017
PROCESS OF MAKING ARTICLES FROM FILMS OF THERMOPLASTIC MATERIAL

Richard L. Ropiequet, and Margaret J. Montag, both of Portland, Oreg., assignors to Alta Industries, Incorporated, Portland, Oreg.

Filed July 28, 1969, Ser. No. 852,963
Int. Cl. B32b *33/00*
U.S. Cl. 156—251 **14 Claims**

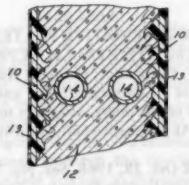


A process is disclosed for making articles of ornamental or unusual appearances by cutting and heating operations performed on a plurality of layers of thermoplastic film material which has been stretched, preferably in two directions at right angles to each other, during manufacture, so as to fuse the layers of material together at least at their edges and in most cases cause contraction of the films in directions parallel to their faces and expansion in a direction perpendicular thereto. A particularly effective procedure is to form an elongated composite roll or bundle of the film material or rods of thermoplastic material or both and to then slice the resulting structure transversely into wafers. These wafers may be heated differentially to cause them to deform into unusual shapes. A number of different types of articles thus made are also shown.

3,654,018
BONDING SKIN TO CONCRETE

David L. Bogue, Pompano Beach, and William E. Fisher, Jupiter, both of Fla., assignors to KMS Industries, Inc., Ann Arbor, Mich.

Filed Feb. 11, 1970, Ser. No. 10,570
Int. Cl. B28b *5/00;* **B32b** *7/08, 13/12*
U.S. Cl. 156—245 **1 Claim**



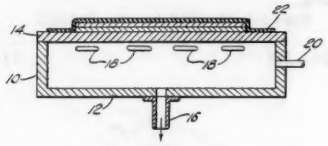
A method of forming a solid structure to carry loads and have an attractive appearance which has a smooth and attractive outer surface formed as a fiber-included resin lay-up

of a hard material having an inner surface with hooked projections provided by pulling material from the lay-up and allowing such to droop by gravity and thereafter depositing hardenable aggregate thereover to form an interlocking bond.

3,654,019
METHODS AND APPARATUS FOR BONDING LAMINATE MATERIALS

Gordon Edward Cusick, Dalebrook, Handforth Road, Wilmslow, Chesire, England

Filed Dec. 10, 1969, Ser. No. 883,734
Int. Cl. B29c *17/00*
U.S. Cl. 156—285 **5 Claims**

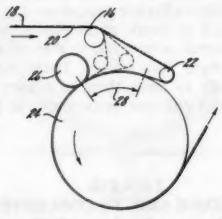


Methods and apparatus for adhering outer facing fabrics to fusible interlining backing fabrics by pressing such fabrics together by a suction or negative pressure created by a vacuum, and heating the fabrics while they are so pressed together to cause them to adhere to each other to form laminated materials.

3,654,020
PROCESS FOR THE PREPARATION OF TISSUE-FIBER LAMINATES

James E. Robinson, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Mar. 30, 1970, Ser. No. 23,889
Int. Cl. B32b *7/14*
U.S. Cl. 156—291 **6 Claims**



Tissue-fiber laminates are prepared by substantially completely embedding a nonwoven fibrous web in a patterned layer of a plastisol adhesive partially embedded in the tissue web. Embedment of the fibrous web is accomplished while the adhesive is in a fluid state.

3,654,021
BONDING PHOTOSENSITIVE PLATES, SHEETING OR FILM TO METALLIC SUPPORTS

Herbert Henkler, Darmstadt; Heinrich Hartmann; Klaus Gulbins, both of Limburgerhof, and Hans Wilhelm, Heinsheim, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Akteingesellschaft, Ludwigshafen am Rhine, Germany

Filed Oct. 28, 1968, Ser. No. 771,276
Claims priority, application Germany, Oct. 28, 1967, P 15 97 515.2
Int. Cl. C09j *3/16*
U.S. Cl. 156—331 **8 Claims**

A process for applying photosensitive plates, film or sheeting of a polymerized base material to a metallic support using a reaction product of an oligomer and/or polymer containing active hydrogen atoms and a polyisocyanate as bonding agent.

3,654,022
METHOD OF MAKING A LAMINATED PHOTOGRAPHIC IDENTIFICATION CARD

Donald G. Wiest, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

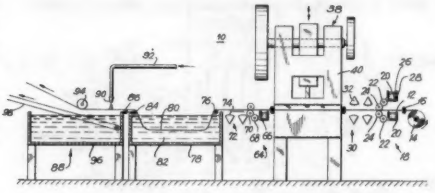
Original application Aug. 7, 1967, Ser. No. 658,705, now Patent No. 3,520,758. Divided and this application Dec. 10, 1969, Ser. No. 883,816
Int. Cl. C09j *5/06*
U.S. Cl. 156—320 **10 Claims**

An embossable identification or credit card has been made by laminating the photographic emulsion layer of a transparent photographic film to a rigid substrate using an adhesive based on a latex of poly(vinyl acetate) copolymerized with an alkyl ester of an unsaturated carboxylic acid to which gelatin, gelatin plasticizer and an attach solvent for the substrate are added. The migration of the plasticizer from the adhesive into the emulsion during and subsequent to lamination causes an increased hardening and/or plasticizing of the emulsion and improves cohesive bonding within the emulsion, and consequently the overall toughness, durability and quality of the identification card produced.

3,654,023
MECHANOCHEMICAL SHEET METAL BLANKING SYSTEM

Lawrence M. Rheingold, Baldwin, and Milton Berlin, Forest Hills, both of N.Y., assignors to The Alumet Corporation, Hicksville, N.Y.

Original application Aug. 31, 1967, Ser. No. 664,881, now Patent No. 3,563,819, dated Feb. 16, 1971. Divided and this application Sept. 21, 1970, Ser. No. 73,883
Int. Cl. C23g *3/00*
U.S. Cl. 156—345 **7 Claims**



A system of blanking sheet metal by using a punch and die to stamp a part out of sheet metal stock for only a portion of its thickness so that the part is substantially surrounded by a peripheral fracture but is still retained by the stock and projects a fraction of its thickness therefrom, protecting the broad faces of the part with a resist, then chemically etching the stock and part so that the etch attacks the metal at the fracture and thereby loosens the part and finally removing the part from the stock.

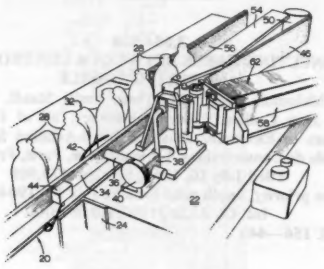
3,654,024
AUTOMATIC LABELLING APPARATUS

Gustav Heinricy, West Hill, Ontario, Canada, assignor to Canadian Stackpole Limited

Filed Dec. 1, 1969, Ser. No. 881,006
Int. Cl. B65c *9/10, 9/42*
U.S. Cl. 156—363 **4 Claims**

An automatic labelling apparatus for labelling containers passing on a conveyor has a sensing arm, connected to a switch, the arm contacting the containers passing on the conveyor; the switch is connected to an energized solenoid which forces up a shaft against a spring. The upper end of the

shaft carries a helical gear which in turn meshes with another helical gear attached to the lower end of the spindle on the discharge roller, a finger member being mounted on the spindle. In this position the finger member is withdrawn from the discharge opening of the magazine. When a container hits



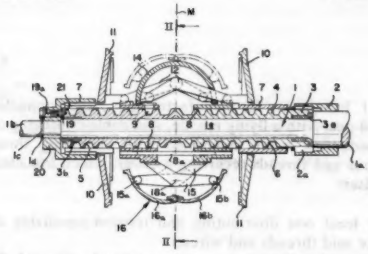
the sensing arm, the solenoid is de-energized with the result that the shaft is pushed downward by the spring and the interaction of the helical gears rotates the finger member into the position where it enters the discharge opening and extracts a label from the magazine.

3,654,025

CAMBERING DRUM

Wolfgang Winzer, Jork, and Reinhard Piotrowski, Hamburg, both of Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Feb. 9, 1970, Ser. No. 9,557
Claims priority, application Germany, Feb. 7, 1969, P 19 06 023.2; Jan. 20, 1970, P 20 02 294.0
Int. Cl. B29h *17/26*
U.S. Cl. 156—415 **14 Claims**



A drum for the cambering of belt-tire carcasses in which sets of toroid segments are displaced radially outwardly nonuniformly to form a cambering shell upon which the tire carcass is deformed by the axial movement of a pair of actuating members coupled by lever linkages with the segments. The shell is flanked by a pair of lateral disks for centering the tire carcasses and coupled with the axially shiftable members.

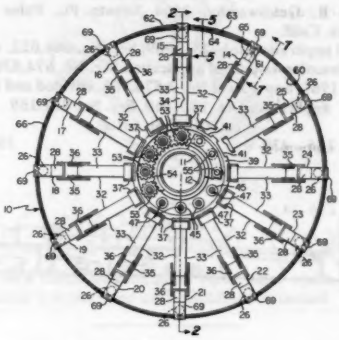
3,654,026

ADJUSTABLE DIAMETER BAND BUILDING DRUM

Max D. Brinkley, North Canton, and Robert I. Griffiths, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 20, 1970, Ser. No. 13,253
Int. Cl. B29h *17/16*
U.S. Cl. 156—418 **19 Claims**

A machine for building bands composed of successive layers of rubberized tire building material. The machine has a number of arcuately spaced supports which are held in spaced relation from a centrally disposed elongated shaft by a plurality of expansible and retractable spokes. A relatively thin metallic shell with a pair of overlapped ends, is disposed in surrounding relation around the supports and provides a



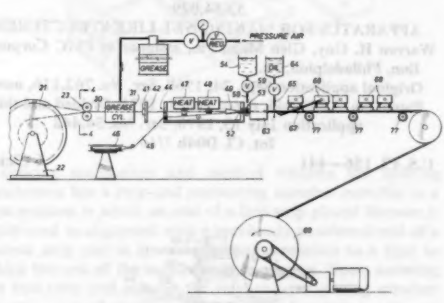
working surface on which the generally cylindrical bands are formed. A rubber sleeve is placed around the shell to maintain it in supported relation against the supports. The diameter and circumference of the shell are varied by expanding and retracting the spokes in unison.

3,654,027

APPARATUS FOR MANUFACTURING A SHEATHED CABLE FOR USE IN POST-TENSIONING CONCRETE STRUCTURES

Thomas E. Middleton, Houston, Tex., assignor to Pre-stress Concrete Inc., Houston, Tex.

Filed Sept. 24, 1969, Ser. No. 860,737
Int. Cl. B65h *45/06*
U.S. Cl. 156—438 **7 Claims**



A method and apparatus for manufacturing a loose sheathed cable for use as a post-tensioned reinforcing member in concrete structures including first advancing and lubricating the cable. A plastic strip is advanced adjacent to the cable and heat is applied to soften the edges of the strip. The plastic strip is then formed into a sheath about the cable with the softened edges in overlapping relationship. A solvent applicator is interposed between the overlapping edges to uniformly apply a solvent coating to the contiguous surfaces of the edges. The softened, solvent coated edges are then urged together to form a bond. The exterior of the overlapped portion of the plastic sheath may be lubricated to cool the heated edges and to reduce friction as the sheathed cable

comes into contact with additional members which press the overlapped edges together to ensure a good bond.

3,654,028

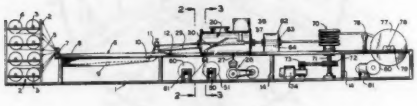
APPARATUS FOR MAKING FILAMENT REINFORCED A-STAGE PROFILES

William B. Goldsworthy, 2504 Novato Pl., Palos Verdes Estates, Calif.

Original application July 23, 1969, Ser. No. 844,022, which is a continuation-in-part of application Ser. No. 674,820, Oct. 12, 1967, now Patent No. 3,576,705. Divided and this application Oct. 13, 1969, Ser. No. 871,159

Int. Cl. B65h *65/00*

U.S. Cl. 156—438 **18 Claims**



Fiberglass filament unwound from a series of spools is impregnated with a resin matrix and passed through a pair of rollers or sizing bushing for removing the excess resin and air therefrom. The resin impregnated fiberglass is then envelopely enclosed within a sheet of unidirectionally oriented plastic film, the latter being sealed along its upper longitudinal margin by means of an ultrasonic weld or heat weld. The film enclosed composite may then be heated to shrink the film. The temperature should be sufficiently low to have no curing effect on the resin leaving it in the uncured or so-called "A-stage." For some systems, it is desirable to advance the resin to a semicured or so-called "B-stage." The film enclosed composite may then be wound upon suitable reels and stored for further use.

3,654,029

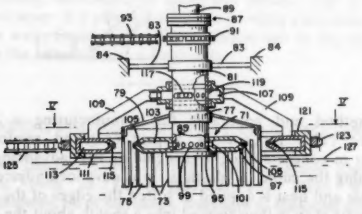
APPARATUS FOR MAKING NET-LIKE STRUCTURES

Warren H. Guy, Glen Mills, Pa., assignor to FMC Corporation, Philadelphia, Pa.

Original application Sept. 24, 1968, Ser. No. 762,116, now Patent No. 3,562,046, dated Feb. 1, 1971. Divided and this application July 13, 1970, Ser. No. 54,442

Int. Cl. D04h *3/16*

U.S. Cl. 156—441 **6 Claims**



Apparatus for making a net-like structure by which streams of strand-forming material are extruded and combined in crossing relationship, and including means which permit the streams to be connected to each other at only selected of their locations of crossing whereby the resulting structure includes mesh strands which are bonded to certain of the strands crossing therewith to form integral, unitary strand junctions and are unconnected to other of such strands at their points of crossing.

3,654,030

CONNECTING CABLE BETWEEN A CONTROL POST AND FLYING MISSILE

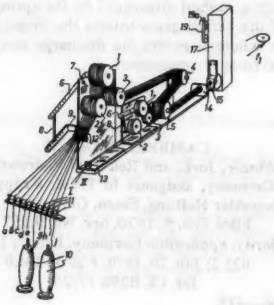
Henri Melquion, Joinville-Le-Pont; Emile Stauff, Versailles, and Jean Guillot, Chatenay-Malabry, all of France, assignors to Electrofil, Sein and Nord-Aviation Societe Nationale de Constructions Aeronautiques, Paris, France

Filed July 16, 1965, Ser. No. 473,908

Claims priority, application France, July 16, 1964, 981,949

Int. Cl. B32b *31/00;* **H01b** *13/00*

U.S. Cl. 156—441 **5 Claims**



1. Installation for manufacturing a cable connecting a control post with a flying missile, said cable consisting of electric conducting wires assembled with sheathing threads, said wires and threads receiving a cover, which installation comprises:

at least one distributing and tension-equalizing device for the said threads and wires,

grooved rollers arranged in a triangle on said distributing and tension-equalizing device and over which the said threads and wires pass,

a pivoting lever secured to the spindle of one of said rollers,

a loaded spring connecting a fixed point on said device with said pivoting lever, whereby the said roller is resilently mounted to enable the tensions of the said threads and wires to be adjusted.

3,654,031

APPARATUS FOR MAKING EXTRUDED NETS HAVING INTEGRAL STAND JUNCTIONS

Theodore H. Fairbanks, Liverpool, Pa., assignor to FMC Corporation, Philadelphia, Pa.

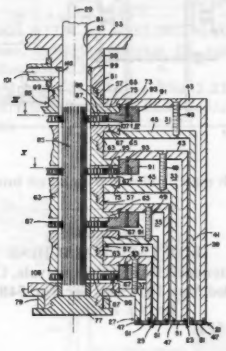
Filed Oct. 29, 1969, Ser. No. 872,089

Int. Cl. D04h *3/16*

U.S. Cl. 156—441 **5 Claims**

An apparatus for making an extruded net-like structure

having intersecting mesh strands in which at least portions of certain mesh strands pass directly through other mesh strands at their locations of intersection and are bonded thereat.

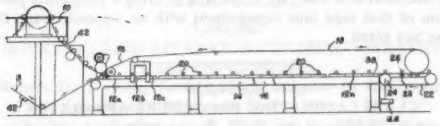


3,654,032

APPARATUS FOR MAKING CORRUGATED PAPER BOARD

Frank A. Kruglinski, North Bergen, and Joseph A. Miller, Englewood, both of N.J., assignors to General Corrugated Machinery Co., Inc., Palisades Park, N.J.

Filed Sept. 12, 1969, Ser. No. 857,306
Int. Cl. B31f *1/20*
U.S. Cl. 156—470 3 Claims



Apparatus for making corrugated paper board of the type having at least two facing sheets. The contacting component webs of supply material are fed along heating plates to adhesively secure them together. To prevent board warpage because of the outer (bottom) facing sheet's being drier than the inner (top) sheet, moisture is added to the outer sheet after the board leaves the heating plates, to equalize the moisture content of the two sheets.

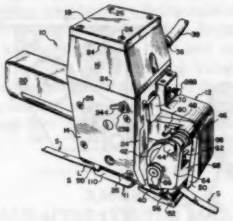
3,654,033

STRAP TENSIONING AND SEALING TOOL

Barry R. Angarola, Schaumburg, and Robert J. Nix, River Grove, both of Ill., assignors to Signode Corporation

Filed Apr. 1, 1970, Ser. No. 24,667
Int. Cl. B32b *31/16*
U.S. Cl. 156—494 15 Claims

A fully automatic cyclicly operable strapping tool for tensioning a loop of fusible plastic strapping having overlapping and regions about an object and thereafter, when a predetermined degree of tension has been attained in the loop, severing the tensioned loop from the source of strapping and effecting and maintaining interfacial friction between such end regions until fusion welding takes place, after which interfacial pressure is maintained until solidification occurs.

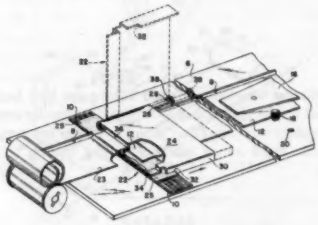


3,654,034

APPARATUS FOR POSITIONING STRIP ENDS IN A SPLICING ALIGNMENT

Paul A. Hermle, and Philip A. Payne, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 21, 1969, Ser. No. 817,870
Int. Cl. B31f *5/00*
U.S. Cl. 156—502 4 Claims



Splicing mechanism and method wherein the splicing mechanism has a strip-end positioning member movable to a first position in which an end of a first strip placed thereon is positioned in alignment with a previously positioned end of a second strip and in spaced registering relation to a tape to which the end of the second strip is secured. Upon arresting the first strip and moving the strip-end positioning member toward a second position, the end of the first strip is released for movement by any suitable means into splicing engagement with the tape.

3,654,035

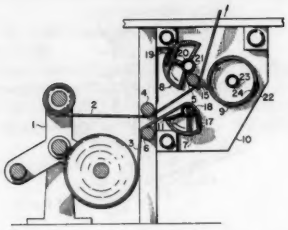
WEB BUTT SPLICING APPARATUS

Hisashi Takimoto, Kanagawa, Japan, assignor to Fuji Photo Film Co. Ltd., Kanagawa, Japan

Filed Jan. 26, 1970, Ser. No. 5,452
Claims priority, application Japan, Feb. 26, 1969, 44/14401
Int. Cl. B31f *5/06;* B65n *19/18;* G03d *15/04*
U.S. Cl. 156—505 5 Claims

Three rotatable drums are mounted on a framework with two of the webs carrying a cooperating cutting tool with old and new webs fed therebetween. Rotation of the same causes

simultaneous cutting of the old and new webs as they are held in overlapping position to achieve butt positioning of the



ends while an adhesive strip carried on the periphery of the third drum moves into position to overlap the abutting ends.

3,654,036

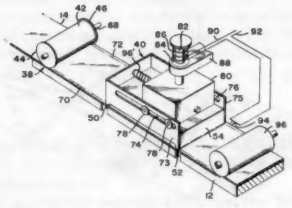
APPARATUS FOR APPLYING COVER SLIDES

Thomas O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Robert L. Oliver, Granada Hills, and Edward F. Zimmerman, Newhall, both of Calif.

Filed Jan. 28, 1970, Ser. No. 6,615

Int. Cl. B32b *31/10, 31/18, 31/20*

U.S. Cl. 156—510 **3 Claims**



Apparatus for applying thin glass slides to solar cells in an assembly line manner including a conveyor belt, a cartridge feeder for consecutively feeding cells onto the conveyor belt, and rollers for feeding a long strip or coil of thin flexible glass along a path parallel to the conveyor belt. The cells and sheet are first sprayed with an adhesive, moved through a drying chamber, and moved together by rollers that press down the glass sheet. After the strip and cells have been pressed together, they pass through a drying chamber and are ready for separating. The strip is separated by applying hot wires to the strip around each cell to which it is held and thereafter breaking the strip at these parting lines.

3,654,037

METHOD AND APPARATUS FOR MAKING PLASTIC TUBES

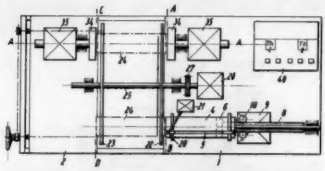
Fritz Lieblang, Seehofstrasse 3, D-1 West-Berlin, 37, Germany

Filed July 24, 1969, Ser. No. 853,584

Int. Cl. B32b *31/02, 31/16*

U.S. Cl. 156—512 **11 Claims**

A method and apparatus for manufacturing tubes bent from a foil of plastic material which is flanged on one or both



ends and which may be closed by a lid on one or both ends.

3,654,038

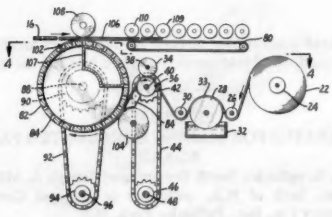
BOX TAPING MACHINE

William J. Hottendorf, Box 566, Sunnyvale, Calif.

Filed May 10, 1966, Ser. No. 548,964

Int. Cl. B32b *31/00*

U.S. Cl. 156—521 **4 Claims**



This application discloses a machine for taping and folding paperboard box blanks wherein a strip of tape is applied to one side edge of a box blank while the blank is moving in a direction parallel to that edge, and the blank is subsequently folded by structure similar to the folding device shown in Hottendorf U.S. Pat. No. 2,986,078 to bring a projecting portion of that tape into engagement with an opposite edge of the box blank.

3,654,039

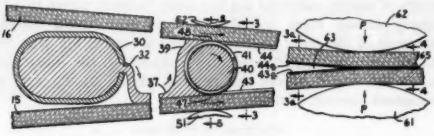
GLASS LAMINATING PROCEDURE APPARATUS

Emil W. Bucher, Lake Bluff, Ill., assignor to Lumni-Strip, Inc., Lake Bluff, Ill.

Filed Feb. 19, 1970, Ser. No. 1,552

Int. Cl. B32b *31/20, 31/12*

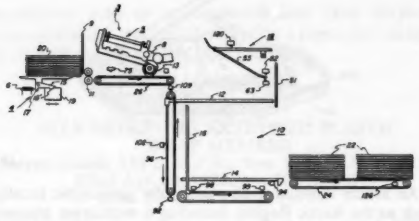
U.S. Cl. 156—558 **8 Claims**



An apparatus for producing laminated glass free of bubbles which includes a cylindrical metering bar interposed between upper and lower convergently-arranged, moving strips of glass which not only meters liquid adhesive but which serves as a doctor to fill any shallow depressions in the glass, thereby to establish perfectly planar adhesive surfaces which are subsequently brought into face contact at a nip using optimum pressure so that a full charge of adhesive is maintained in all of the shallow depressions. In a preferred embodiment the metering bar has metering grooves formed by

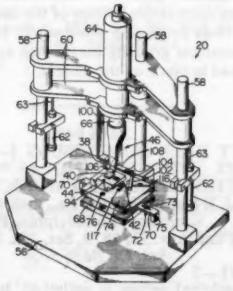
closely spaced convolutions of wire and is rotated at a peripheral speed which is a small fraction of the speed of movement of the glass strips.

3,654,040
STACKER WITH A LABELING MACHINE
Donald W. Watson, Arlington Heights, Ill., assignor to Xerox Corporation, Rochester, N.Y.
Filed Jan. 12, 1970, Ser. No. 2,222
Int. Cl. B32b *31/20;* **B65h** *31/12*
U.S. Cl. 156—568 **2 Claims**



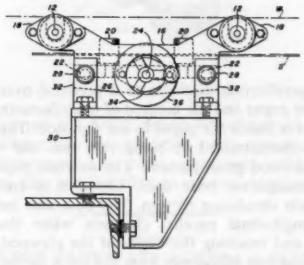
An article stacker labeler combination including a movable elevator upon which articles may be stacked from a labeler, stack transfer means adapted following predetermined descent of the elevator to intercept and remove a completed stack from the elevator to enable the completed stack to be ejected from the stacker and the elevator reset for the next stack, stack ejector means adapted when actuated to move the completed stack along the stack transfer means and out of the stacker, and control means for the elevator and the ejector means adapted to lower the elevator as a stack builds up thereon, and, following transfer of the completed stack from the elevator to the transfer means, to actuate the ejector means to remove the completed stack, the control means including means to quickly return the elevator to the stack-start position following ejection of the completed stack from the stacker.

3,654,041
SONIC WELDING APPARATUS UTILIZING VIBRATION DAMPENING MEANS
Robert D. Wysong, Goshen, Ind., assignor to Robertshaw Controls Company, Richmond, Va.
Original application Aug. 8, 1967, Ser. No. 659,189, now Patent No. 3,499,809. Divided and this application Dec. 9, 1969, Ser. No. 879,979
Int. Cl. B32b *31/16;* **B29c** *27/08*
U.S. Cl. 156—580 **13 Claims**



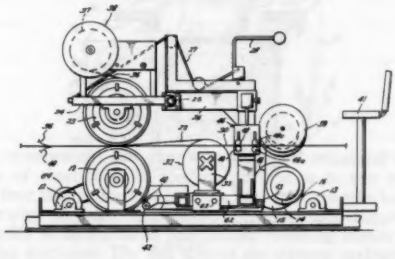
This application discloses an apparatus and method for the sonic welding of one or more flexible or vibratable blades with a blade portion of each blade held by two or more plastic holding members with a free blade portion extending out of said plastic holding members. A vibration damping means is provided to dampen the vibratable blade free portion of each of such one or more blades to prevent crystallization and fatigue of said vibratable blade or blades while said plastic holding members are being sonically welded. The vibration damping means may include a damping pad carried by one sonic welding means or base and another damping pad carried by another sonic welding means or horn. The blade or blades may each have a second free portion extending from the plastic holding members in another direction, and such second free portion may be dampened by a third damping pad.

3,654,042
METHOD AND APPARATUS FOR ROLL PRESSURE BONDING
Paul C. Lipsie, Apollo, Pa., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.
Filed Jan. 2, 1970, Ser. No. 175
Int. Cl. B32b *31/20*
U.S. Cl. 156—582 **18 Claims**



A method and apparatus for roll pressure bonding a plurality of spaced apart stripes to a substrate, which insures accurate alignment of the striping material by employing striping material guides which laterally move from side to side with the substrate.

3,654,043
MOVABLE HEAT-SEALING APPARATUS
William I. Jacobi, 1108 Nevada St., Northfield, Minn.
Filed Nov. 28, 1969, Ser. No. 880,864
Int. Cl. B32b *31/08;* **B29c** *27/06*
U.S. Cl. 156—582 **4 Claims**



This patent relates to a machine for heat-sealing two sheets of material together while moving along a track. The machine is provided with heat-sealing wheels, a support for a sheet or material carried by the machine, an edge-guide as-

sembly for guiding a second sheet of material external to the machine into position to be sealed to the sheet carried by the machine, supports for strips of material to be utilized in sealing, and means for laterally adjusting all such parts to align them with the external sheet.

3,654,044

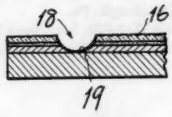
DECORATIVE OVERLAY PAPER COVERED PLYWOOD AND PROCESS OF MANUFACTURING THE SAME

Hatsuo Hirota, Nagoya, Japan, assignor to Toyo Plywood Co., Ltd., Nagoya-shi, Japan

Continuation-in-part of application Ser. No. 763,426, Sept. 27, 1968, now abandoned. This application Nov. 10, 1970, Ser. No. 88,443

Int. Cl. B32b *21/06;* **E04f** *13/10*

U.S. Cl. 161—2 **17 Claims**



This specification discloses to a plywood overlaid with a decorative paper and the method of manufacturing the same. An adhesive bonds the paper to the plywood. The decorative paper is characterized by being very thin and by having a simulated wood grain pattern. The overlaid paper is coated with a transparent resin coat. The coat is embossed with wood-grain simulating pattern. The coat also includes elongated longitudinal parallel channels wider than the embossings and reaching the depth of the plywood. The channels are colored differently from the color of the wood grain pattern.

3,654,045

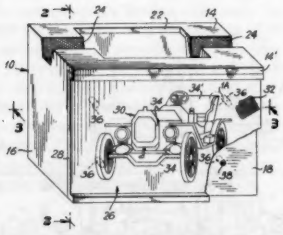
PLASTIC CONSTRUCTION FOR AN ITEM USED IN A HEAT ENVIRONMENT, SUCH AS AN ASHTRAY

Robert D. Kahn, Rockville Centre, N.Y., assignor to Fedtro, Inc., Rockville Centre, N.Y.

Filed Jan. 21, 1970, Ser. No. 4,503

Int. Cl. D04d *7/04;* **A24f** *19/00*

U.S. Cl. 161—7 **1 Claim**



A structure for a utilitarian item, such as an ash tray, for exposure to heat, including a nonflamable, heat resistant main body portion and an attached decorative portion formed of a material which is suitable for decorative hot stamping and engraving processes.

3,654,046

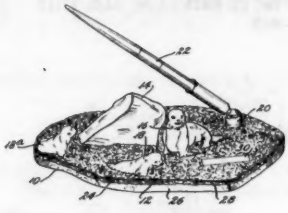
DECORATIVE NOVELTY DEVICE

Joanne C. Crane, 12005 Woodbine Lane, S.W., Tacoma, Wash.

Original application Mar. 11, 1966, Ser. No. 533,484, now abandoned. Divided and this application Oct. 15, 1969, Ser. No. 871,414

Int. Cl. B44f *1/00*

U.S. Cl. 161—5 **1 Claim**



An article illustrative of a particular geographic location, such as the Arctic Region, including a multi-layer base with decorative and utilitarian objects mounted thereon. The base includes a lower portion or mass of substantially completely fused pellets and an upper portion or mass of partially fused pellets to produce light scintillations.

3,654,047

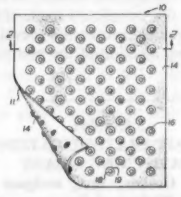
SURGICAL INSTRUMENT HOLDER

Howard Berkowitz, 19 Beaverdale Road, Stony Brook, N.Y.

Filed Jan. 12, 1970, Ser. No. 2,035

Int. Cl. B32b *3/12;* **F16b** *47/00*

U.S. Cl. 161—7 **10 Claims**



A surgical pad for draping over a patient to hold various articles thereon is manufactured of a flexible sheet of nonporous plastic material. The bottom side of the sheet has a roughened, friction gripping surface with portions pressed upwardly to define projections on the upper surface which may engage articles placed on the sheet. The projections define cavities open at the bottom of the sheet which are surrounded by rings projecting downwardly from the sheet to serve as mechanical gripping means and as suction cups for holding the pad in place on the patient.

3,654,048

COMPACT BALE COMPRISING 1–15 PARTS BY WEIGHT BITUMEN AND 85–99 PARTS BY WEIGHT OF SHREDDED MUNICIPAL REFUSE

Robert J. Bathgate, Media, Pa., assignor to Sun Oil Company, Philadelphia, Pa.

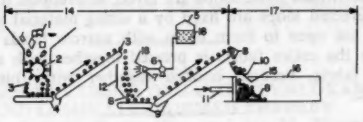
Filed Apr. 13, 1970, Ser. No. 27,652

Int. Cl. B65f *5/00*

U.S. Cl. 161—7 **9 Claims**

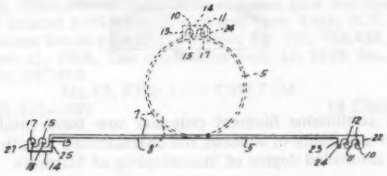
After municipal refuse is collected, it is shredded and compressed into a bale. The distribution throughout the shredded municipal refuse of an additive, prior to compression, substantially improves the physical properties of

the compressed bale. The additive can be either a bitumen or bitumen containing a minor quantity of a petroleum



naphthenic acid or a polyoxyethylene fatty alkyl-1,3-propanediamine, said additive having a paper peel strength of at least 0.4 pound per inch at 70° F.

3,654,049
SELF-RETAINING EXTRUDED PLASTIC WRAP MEMBER
Steven Ausnit, 124 E. 61st St., New York, N.Y. 10021
Filed Apr. 30, 1970, Ser. No. 33,307
Int. Cl. A44b *19/10, 19/14*
U.S. Cl. 161—7 **3 Claims**



A self-retaining, one-piece, extruded plastic wrap member having a sheet-like flexible body with an object-embracing inner face and longitudinal edges which are arranged to be in edge-to-edge joint abutment when the body is wrapped about an elongated object with the inner face backed in substantially continuous engagement with the article at both sides of the joint and having a complementary interlock structure provided along the edges on the opposite outer face of the body to secure it about the object.

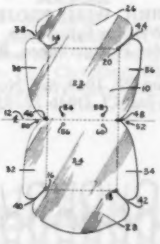
3,654,050
FABRICATED STRUCTURE OF IMPROVED EXPANDABLE DIMENSIONAL PRECISION AND METHOD
Allister F. Fraser, Santa Barbara, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Filed Oct. 6, 1969, Ser. No. 863,888
Int. Cl. B65h *81/04*
U.S. Cl. 161—17 **10 Claims**

The method of preparing improved collapsible expansible and rigid or reinflatable, rerigidizable fiber wound structures forming inflatable units of relatively uniform expanded and re-expanded dimensional precision in erected rigid states by using an isotensoid-geodesic design of fibers in predesigned, nonstressed fiber relationship and impregnating the same with a space hardenable impregnate and preferably a multicurable impregnate, which impregnated fabric upon fashioning, after collapsing and upon expansion, to the cured form, provides lightweight, close precise structure of rigidized dimensional precision.

3,654,051
CARPET TILE
Arthur Bieler, Miami, Fla., assignor to The Celotex Corporation, Tampa, Fla.
Filed July 16, 1969, Ser. No. 842,213
Int. Cl. B32b *3/00, 25/00*
U.S. Cl. 161—37 **8 Claims**

A pile carpet tile has a generally polygonal periphery with complementary irregularities along opposite edges to insure a homogeneous seamless appearance with concealed edges when tiles are installed to cover a large area.

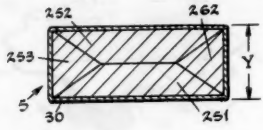
3,654,052
STRUCTURES FABRICATED FROM A PLURALITY OF SIMILAR STRUCTURAL ELEMENTS ARRAYED IN A REPETITIVE PATTERN
Ralph K. Rye, 102 Bellevue Road, Swampscott, Mass. 01907
Filed Oct. 27, 1969, Ser. No. 869,826
Int. Cl. B32b *3/06, 3/10*
U.S. Cl. 161—37 **5 Claims**



A symmetrical and generally four-sided structural element of sheet material has ears formed at its two ends and four tabs formed on its sides, said ears and tabs being dovetailed to define four corner engaging slits extending inwardly to terminate at four corner fastening means receiving apertures. The side tabs of the element preferably slope inwardly toward central fastening means receiving apertures provided in alignment with the corner fastening receiving apertures to define central engaging nips so that a plurality of the structural elements may be interlocked in partially overlapped relationship at their corners and/

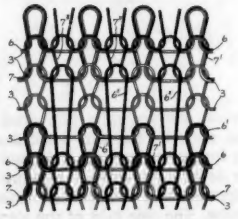
or at their sides. The preferred fastening means for the elements is a grommet formed with prongs adapted to spring back after insertion through the fastening means receiving apertures. A lamp shade spider is also provided for use in the preferred structure formed from the invention, which spider is designed to detachably receive a variable number of supporting spokes in preferably equiangular relationship so as to afford maximum versatility in the selection of lamp shade size and configuration.

3,654,053
DECORATIVE PANEL, PLATE, BOARD OR THE LIKE AND METHOD OF FABRICATING SAME
William C. Toedter, Toledo, Ohio, assignor to Re-Flect-O-Lite Corporation, Toledo, Ohio
Filed Nov. 19, 1969, Ser. No. 877,812
Int. Cl. B32b *3/04, 3/10, 3/22*
U.S. Cl. 161—43 **6 Claims**



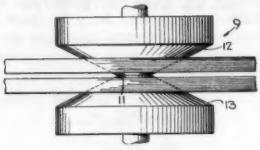
An article comprising an unfinished, but film clad, flat, relatively inexpensive blank, scored, folded and adhesively secured to synthesize a finished decorative panel, plate, board or the like having the appearance of relatively expensive material or finish and a method of fabricating such article and that at various thicknesses, notwithstanding the thickness dimension of the clad blank from which the panel is constructed. As used herein in the hereto appended claims, the words "panel, plate, board or the like" shall be each understood to refer to a smooth, generally flat, relatively thin, internally integrated body extending laterally to dimensions greatly in excess of the dimensions of its axial extension and presenting, superficies, a pair of major and opposite parallel faces of like dimensions and outline spaced from each other and adjoined by intermediate edge and often end surfaces.

3,654,054
KNITTED FABRIC WITH PROJECTING BARBS
Norbert Waller, Weil im Schonbuch, Germany, assignor to Gottlieb Binder Holzgerlingen, Baden-Wurttemberg, Germany
Filed Aug. 22, 1969, Ser. No. 852,295
Int. Cl. D04b *21/02*
U.S. Cl. 161—48 **4 Claims**



A knitted fabric consisting of a base fabric into which while being knitted a supplementary monofilament thread of a thermoplastic material is knitted so as to form loops which are drawn out to a considerable length and are then set by a heat treatment and erected to an upright position relative to the base fabric either by stretching the latter or by means of special hook-shaped tools around which these loops are layed, whereupon these set and erected loops are fixed by a sizing material and are then cut open to form barbs with narrow heads which, when the entire fabric is pressed together with another pile fabric, become hooked together with this other fabric.

3,654,055
TOW BAND
Jack N. Gray, Columbia, S.C., assignor to Fiber Industries, Inc.
Continuation of application Ser. No. 700,960, Jan. 26, 1968, which is a division of application Ser. No. 382,328, July 13, 1964, now Patent No. 3,380,131. This application Sept. 8, 1970, Ser. No. 70,468
Int. Cl. B32b *5/12*
U.S. Cl. 161—60 **7 Claims**



A continuous filament polyester tow band produced from a plurality of subtows and characterized by a limited and controlled degree of intermingling of filaments.

3,654,056
FINISHED GLASS TEXTILE MATERIALS AND METHOD OF FORMING SAME
John L. Nisbet and Hubert C. Woodall, Jr., Winston-Salem, N.C., assignors to Carolina Narrow Fabric Company, Winston-Salem, N.C.
Continuation-in-part of abandoned application Ser. No. 764,303, Oct. 1, 1968. This application Sept. 17, 1969, Ser. No. 858,796
Int. Cl. D05c *17/02*
U.S. Cl. 161—62 **23 Claims**

A producer-sized fiber glass material, such as yarn, is chemically desized with a size converting enzyme and the material is then finished, as by applying a resin bonded pigment finish thereto, to form a product of higher strength, flexibilty and abrasion resistance than former products desized and finished in accordance with conventional techniques.

3,654,057
SELF-SEALING FUEL TANK
Albert Olevitch, 3100 Early Road, Dayton, Ohio 45415, and David H. Littlefield, Enon, Ohio (6 Kendon Road, Pittsford, N.Y. 14534)
Filed Oct. 21, 1970, Ser. No. 82,658
Int. Cl. B32b *3/12, 3/26*
U.S. Cl. 161—69 **5 Claims**

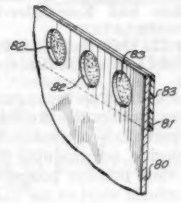
A self-sealing fuel tank comprises two rubber layers and a plurality of sealer packages mounted between the layers. The sealer packages contain a foamable polymeric material dissolved in a highly volatile solvent. If the two rubber layers and one or more of the sealer packages are ruptured, e.g., by a bullet passing therethrough, the highly volatile solvent is exposed to the atmosphere and evaporates. Upon evaporation of the solvent, the foamable polymeric material produces a foam which plugs the

bullet holes in the adjacent rubber walls. This combination of events prevents fuel from leaking out of the fuel tank. Fuel tanks of this invention are useful in military vehicles such as aircraft, tanks, and trucks which are liable to be struck by projectiles such as bullets, shells and shrapnel.

3,654,058
METHODS OF CURING ORGANOPOLYSILOXANES AND LAMINATES FORMED THEREBY
Amy L. Jasinski, Reston, Va., and Ian M. Thomas, Temperance, Mich., assignors to Owens-Illinois, Inc.
No Drawing. Continuation-in-part of application Ser. No. 777,139, Nov. 19, 1968. This application Aug. 20, 1970, Ser. No. 65,670
Int. Cl. C08g *31/24, 47/10*
U.S. Cl. 161—93 **16 Claims**

A glass cloth laminate prepared from solutions of organopolysiloxanes prepared from trialkoxysilanes. The curing of the organopolysiloxanes is accomplished by the use of a phosphonic acid (or precursor thereof) catalyst which markedly reduces the gel time of the resin in the laminate in the press whereby strong, hard, blister-free laminates are prepared.

3,654,059
DISPOSABLE COVERING
Jack K. Zisblatt, Fort Lee, N.J., assignor of a fractional part interest to Allison C. Collard, New York, N.Y.
Continuation-in-part of application Ser. No. 768,439, Oct. 17, 1968. This application Sept. 15, 1969, Ser. No. 857,809
Int. Cl. B32b *3/10;* **C09j** *7/04*
U.S. Cl. 161—109 **14 Claims**



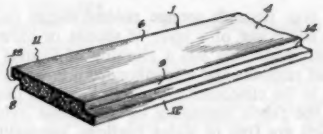
A disposable covering such as an antimacassar for the protection of beds, sofas and chairs consisting of non-woven fabric material having one or more adhesive strips disposed along one or more of its surfaces, and containing a backing strip or adhesive release for covering the adhesive until the non-woven, disposable fabric is ready for use. The covering may serve as a headrest cover, or a mattress cover, and after use, may easily be removed from the article of furniture without leaving behind any of its adhesive backing.

3,654,060
ABSORBENT SLITTED MULTI-PLY FILMS
Maurice A. Goldman, Newark, N.J., assignor to Fibre Products Laboratories, Inc.
Filed Dec. 29, 1969, Ser. No. 888,653
Int. Cl. A61l *15/00;* **B32b** *3/10, 31/18*
U.S. Cl. 161—112 **10 Claims**

An absorbent multi-ply film or sheeting product comprising a layer of plastic sheet material having adhered to at least one side thereof a fibrous facing layer, the multi-ply film or sheeting product being further provided with a plurality of elongated slits which extend at least through the plastic layer, the product being absorbent, supple, aseptic and flameproof and having sufficient absorbency, body and tensile strength for use as shielding

materials, such as, protective coverings, drapes, clothing, etc., particularly in medical, surgical, and convalescent hospitals.

3,654,061
PIPE WRAP
John J. Berwanger, Hinsdale, Ill., assignor to Hood Sponge Rubber Company, Chicago, Ill.
Filed Nov. 19, 1970, Ser. No. 90,909
Int. Cl. B32b *3/02, 5/18*
U.S. Cl. 161—118 **4 Claims**



A pipe wrap comprises a strip of material that has a substantially moisture imprevious skin enclosing a sponge rubber core or interior. The longitudinal margins of the strip are rabbeted to provide short, opposed, outwardly directed flanges that are thinner than the remainder of the strip and are offset from each other such that the strip may be helically wrapped about a pipe with the flanges overlapping and fitting into the rabbets to form a helical seam at which the outer surface of the strip at each turn of the wrap is flush with the outer surface of an adjacent turn of the wrap so that a sheath with a smooth substantially continuous outer cylindrical surface is produced.

3,654,062
INJECTION MOLDED DECORATIVE PLAQUES
Theodore Loew, Schenectady, N.Y., assignor to Standard Products Co., Cleveland, Ohio
Filed Sept. 28, 1970, Ser. No. 75,821
Int. Cl. D21f *13/00;* **D21h** *1/00;* **D21j** *5/00*
U.S. Cl. 161—119 **4 Claims**

A molded decorative plaque is provided comprising a body portion of a plastic material and a facing sheet disposed over the front face of the body portion. The front face of the body portion is provided with a decorative contour and a facing sheet conforms to the contour thereof. The facing sheet is a laminated structure comprised of an outer sheet, a layer of metal on the inner surface of the outer sheet and an inner backing sheet of plastic material which is adhesively bonded to the layer of metal. The plastic material of the backing sheet is com-

patible with the plastic material of the body portion and is joined thereto under heat and pressure to form an integral bond between the body portion and facing sheet. A layer of protective varnish or the like is provided on the outer surface of the facing sheet as an integral part thereof.

3,654,063

CARPET UNDERPAD COMPOSITE

William A. Blackburn, Chapel Hill, and Philip J. Stevenson, Durham, N.C., assignors to Monsanto Company, St. Louis, Mo.

Filed Apr. 9, 1970, Ser. No. 27,003
Int. Cl. B32b *1/00, 3/00*
U.S. Cl. 161—125 **10 Claims**

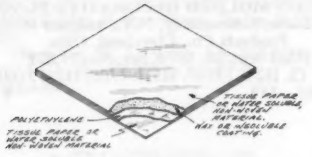
A high tear strength sponge rubber carpet underpad composite comprised of a layer of sponge or blown elastomer which preferably has a plurality of formed bulges or patterned contours and a spunbonded non-woven fabric embedded in the elastomer to a depth less than the fabric thickness, the fabric consisting of continuous nylon filaments which are free of sizing coatings, lubricants, etc., and which have etched surfaces, the filaments being autogenously bonded together at a substantial number of touching cross-over points.

3,654,064

WATER-DISINTEGRATABLE SHEET MATERIAL

David H. E. Laumann, Freehold, N.J.; Isadore I. Zlotkin, trustee in bankruptcy for National Polymers and Chemicals Corporation

Continuation-in-part of application Ser. No. 790,134, Jan. 9, 1969. This application Oct. 30, 1969, Ser. No. 872,656
Int. Cl. A61g *9/00;* **B32b** *9/06*
U.S. Cl. 161—156 **13 Claims**


POLYETHYLENE
TISSUE PAPER OR WATER SOLUBLE HOT MELTED MATERIAL
TISSUE PAPER OR WATER SOLUBLE HOT MELTED MATERIAL
HAS BE HEELUBLE COATING

Coated paper is provided in sheet, roll or other physical form and shape which is water-repellent when wetted on either side but which readily disintegrates when both sides are wetted as when the entire sheet is immersed in water. The paper is preferably of toilet or facial tissue quality or water-soluble or any other type, provided it is not wet-strength grade, which readily disintegrates in water. A water-soluble grade of non-woven fabric may also be used instead of paper. The paper is first covered with an extremely thin (2 to about 5 pounds per ream) coating which does not appreciably penetrate into or impregnate the paper. The coating is preferably an extremely thin layer of polyethylene which serves as a hold-out coating for a subsequent water-repellent coating, preferably of wax, modified with ethyl vinyl acetate or synthetic rubbers and softeners. By flashing the polyethylene or other polymer hold-out layer with heat prior to application of the wax coating or by applying the modified wax at temperatures in the range of 185° to 235° F. (depending on the speed of the wax coating operation) the stretch properties of the polyethylene are totally eliminated and yet the polyethylene serves as a hold-out coating for the flexible wax layer and prevents it from sinking into the tissue paper and rendering it water-insoluble and with wet strength properties. When an additional uncoated sheet of tissue paper is placed on top of the waxy insoluble coating the result is a sheet which repels water as well as the passage of bacteria and other micro-organisms on either side and maintains its strength but which, when wetted on both sides, readily disintegrates or dissolves much like an uncoated sheet of tissue paper. When wetted on one side the sheet derives its strength from the bottom layer of paper which is kept dry and strong by the water-repellent coating. The coating, itself, while flexible and virtually pin-hole free, has no stretch properties and is very weak. When both top and bottom layers of paper are wetted (as when flushed in a toilet) the entire sheet tears and disintegrates readily since there remains nothing to support the thin, weak water-insoluble coating. The sheet material is adapted for a variety of uses in the hospital, sanitary, nursing home and consumer fields and may be cut or shaped into sizes and configurations suitable for the particular intended use.

3,654,065

FLAT-SHAPED ARTICLES OF VINYL POLYMERS AND PROCESS OF PRODUCING SAME

Stefan Dorogi, Geislingen-Steige, Germany, assignor to Goeppinger Raliko- und Kunstleder-Werke GmbH, Goeppingen, Germany

Filed July 22, 1968, Ser. No. 746,392
Int. Cl. B29d *27/00;* **C08f** *29/24, 47/08*
U.S. Cl. 161—159 **36 Claims**

Microporous, air- and water vapor-permeable, water-absorbing sheets, films, foils, or the like flat-shaped articles of vinyl polymers, preferably of homopolymers and copolymers of vinylchloride, are produced by incorporating into the plasticized vinyl polymer compound an aqueous solution of a water soluble vinyl or the like polymer, subjecting the mixture to the action of shearing forces, applying the resulting plastic mixture to a fibrous web serving as support, removing the water from the coating or impregnation under conditions whereby no bubbles are formed, gelling the vinyl polymer by heating, removing the water soluble vinyl or the like polymer by washing from the coating or impregnation, and drying the resulting flat-shaped article. If desired, self-supporting foils are obtained by stripping the coating from the support. The resulting flat-shaped article may be laminated to various kinds of fibrous web before or after removing, by washing, the water soluble components of the vinyl polymer compound.

The vinyl polymer may have admixed thereto other film-forming polymers compatible therewith, plasticizers, extenders, fillers, dyestuffs, pigments, lubricants, antioxidants, stabilizers, anti-aging agents, and, if desired, vulcanization accelerators, cross-linking agents, and other conventionally used additives.

The resulting microporous foils having a microscopically fine cellular reticulate structure and laminates thereof with fibrous webs may be grained, stamped, embossed, printed, dyed, lacquered, and/or subjected to other finishing processes.

The flat-shaped articles according to the present invention are useful for all purposes requiring air- and water vapor-permeability and/or water-absorbing properties, for

instance, as artificial leather to be used as upholstery material, in the garment and shoe industry, and for other purposes.

3,654,066

MANUFACTURE OF A POROUS POLYMERIC SHEET

Osamu Fukushima, Yoshitami Saito, and Yuya Enomoto, Kurashiki, Japan, assignors to Kuraray Co. Ltd., Kurashiki, Japan

No Drawing. Filed Apr. 25, 1969, Ser. No. 819,427
Claims priority, application Japan, May 8, 1968, 43/31,089; May 16, 1968, 43/33,069; May 18, 1968, 43/33,664; May 27, 1968, 43/35,878, 43/35,879; June 8, 1968, 43/39,601, 43/39,602
Int. Cl. B32b *3/26, 27/40*
U.S. Cl. 161—160 6 Claims

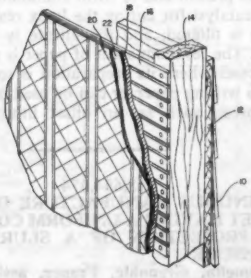
A porous polymeric sheet having a specific gravity of less than 0.7 and a thickness of 0.05 to 2.0 mm. and containing pores inclined at an angle of less than 80° against the plane of the sheet and having a length of 0.03 to 10 mm. A sheet material comprising said porous polymeric sheet and a substrate bound to the lower surface of said porous polymeric sheet. Said porous polymeric sheet is produced by immersing a polymer solution applied to a support into a coagulation bath under a condition of rapid coagulation to coagulate rapidly the upper portion of the solution and to form macropores in the inner portion; stressing the upper portion in transverse direction, that is, a direction parallel to the plane of the support, in the bath to shift the upper portion to transverse direction and to incline the pores formed; treating further the layer with the bath to complete the coagulation, thereby forming porous structure containing pores inclined at an angle of less than 80° against the plane; and peeling off the resulting porous polymeric sheet from the support.

3,654,067

BUILDING WALL STRUCTURE

Solomon A. Klein, 129 North St., Newtonville, Mass. 02109

Continuation-in-part of application Ser. No. 490,157, Sept. 15, 1965, which is a continuation-in-part of application Ser. No. 205,303, June 26, 1962. This application Mar. 16, 1970, Ser. No. 19,720
Int. Cl. B32b *15/06;* E04c *2/02*
U.S. Cl. 161—216 2 Claims



An interior plastered house wall is covered with a covering having a front paper ply and a metal foil back ply, this covering being adhered to the wall by an adhesive composition which (1) facilitates the application of the covering to a wall, (2) permits the covering to be pulled from the wall years later, and (3) effectively holds the covering to the wall for several years unless removed by force.

3,654,068

FLAME RETARDANT FIRE BARRIER LAMINATE

Richard L. Muri, Ashland, Mass., assignor to Ludlow Corporation, Needham Heights, Mass.

No Drawing. Continuation-in-part of application Ser. No. 625,442, Mar. 23, 1967. This application May 18, 1970, Ser. No. 38,584
Int. Cl. B32b *27/08, 27/20, 27/30*
U.S. Cl. 161—251 5 Claims

A flame resistant barrier laminate consisting of (1) a first ply formed of a cellulosic paper impregnated with a halogenated resin and a compound from the arsenic group, (2) a second protective outer ply, and (3) an adhesive comprising a polymer of an unsaturated halogen-bearing monomer and a hydrated metal oxide such as alumina.

3,654,069

POLYSTYRENE LAMINATE AND ADHESIVE-COATED FILM FOR LAMINATION TO POLYSTYRENE

Bertram B. Freudenberg, Wilmington, Del., assignor to Rohm and Haas Company, Philadelphia, Pa.

No Drawing. Filed Nov. 12, 1969, Ser. No. 876,117
Int. Cl. B32b *27/08;* C09j
U.S. Cl. 161—254 8 Claims

Polystyrene sheet can be provided with a decorative and/or protective film coating by utilization of a styrene/acrylonitrile polymer adhesive and a film having a predominantly methacrylate polymeric surface. The preferred laminate combines high impact polystyrene having laminated thereto a film consisting of a heterogeneous polymeric composition having a predominantly methacrylate continuous phase with cross-linked predominantly acrylate polymer dispersed therein. The film coated with adhesive is of particular use in that it can be continuously applied to the substrate at the time of extrusion of the substrate.

3,654,070

OXIDATION AND REUSE OF EFFLUENT FROM OXYGEN PULPING OF RAW CELLULOSE

Louis A. Pradt, Wausau, and Wayne B. Gitchel and Clarence A. Hoffman, Rothschild, Wis., assignors to Sterling Drug Inc., New York, N.Y.

Filed Apr. 2, 1970, Ser. No. 25,116
Int. Cl. D21c *11/14*
U.S. Cl. 162—30 5 Claims

The spent liquor from the pulping of cellulosic material by oxidation in aqueous alkaline medium is subjected to oxidation with an oxygen-containing gas at a temperature between 200° and 375° C., which process oxidizes the organic waste products to carbon dioxide and regenerates the aqueous alkaline medium for reuse in the pulping process. The carbon dioxide produced is collected by liquefaction or directed to energy recovery systems.

3,654,071

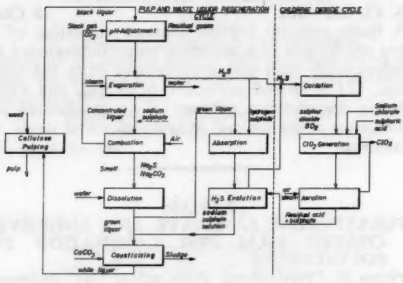
PROCESS FOR REPLACING SODIUM AND SULFUR LOSSES AND FOR CONTROLLING THE SULFIDE CONTENT IN SODIUM- AND SULFUR-CONTAINING CELLULOSIC DIGESTING LIQUORS

Rolf Karl August Brannland, Alfredshem, and Per-Erik Ingemar Alsefelt and Hans Otto Gyllensten, Husum, Sweden, assignors to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Filed May 9, 1969, Ser. No. 823,519
Claims priority, application Sweden, May 10, 1968, 6,377/68
Int. Cl. D21c *11/12*
U.S. Cl. 162—33 16 Claims

A sodium- and sulfur-containing acidic waste liquor from an auxiliary cellulose pulp-treating, processing or

utilization process is combined with the inorganic chemicals recovered from kraft black liquor in an amount to replenish the sodium and sulfur losses and regenerate a white liquor for reuse as a kraft pulping liquor. Any



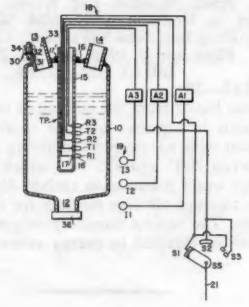
excess sulfur is removed to restore sulfidity to a proper balance by separating hydrogen sulfide, the acidity of the resulting solution being so adjusted as to liberate the sulfur as hydrogen sulfide in appropriate amount.

3,654,072

MONITORING A CHEMICAL PROCESSING SYSTEM BY MEASURING THE INSTANTANEOUS SOUND TRANSMISSION CHARACTERISTICS THEREIN

Frank Massa, Cohasset, Mass., assignor to Massa Division, Dynamics Corporation of America, Hingham, Mass.

Filed May 27, 1970, Ser. No. 40,784
Int. Cl. D21c *7/12*
U.S. Cl. 162—49 **13 Claims**



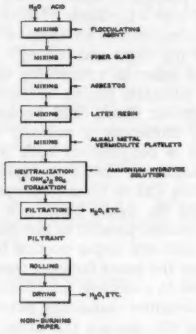
A chemical process is monitored by a system for measuring the instantaneous sound transmission characteristic in a substance being processed. In processes where the substance stratifies, a plurality of measurements are made at different stratums of the material while it is being processed. The sound transmission characteristics are measured by a plurality of electroacoustic transmitting and receiving transducers located within separate regions of the material being processed. A source of alternating electric power drives the transmitting transducers and the intensity of sound level produced is picked up by the receiving transducer which records the sound level through appropriate amplifiers and indicators. As applied to wood chip digestion, the instantaneous sound transmitting characteristics indicate the rate and process of the digestion.

3,654,073

METHOD OF PRODUCING NONBURNING PAPER

Edwin W. Lard, Bowie, and Addison C. White, Takoma Park, Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Dec. 19, 1968, Ser. No. 785,207
Int. Cl. D21h *5/18*
U.S. Cl. 162—145 **11 Claims**



A nonburning paper which is suitable for printing, writing, etc. is disclosed. The basic ingredients of the nonburning paper are asbestos, fiber glass, a light metal vermiculite and a latex resin. The method of producing this nonburning paper, which will extinguish itself in pure oxygen, is as follows: an acidified aqueous solution of flocculating agents is prepared; fiber glass is added and admixed to the acidified solution to prepare a dispersion; asbestos is admixed with the fiber glass dispersion; a latex resin is admixed with the dispersion; a lithium vermiculite suspension is added to the dispersion; sufficient ammonium hydroxed is added to the dispersion to neutralize the acid present and to form ammonium sulfate which acts as a catalyst for curing the latex resin; the resultant dispersion is filtered; and the filtrate is removed, rolled and dried. The resultant sheet of paper is nonburning and, in those cases where its preparation is so tailored, it can be used as writing paper or can be used in a conventional printing press, such as, an offset lithographic printing press.

3,654,074

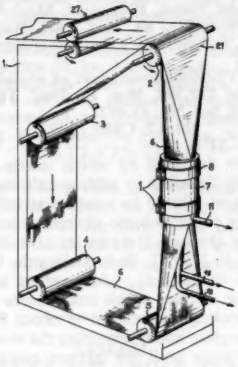
CONTINUOUS MANUFACTURE OF A PAPER SHEET HAVING A UNIFORM CONSISTENCY BY PROJECTION OF A SLURRY UNDER PRESSURE

Guy Jacquelin, Grenoble, France, assignor to Centre Technique de l'Industrie des Papiers, Cartons et Celluloses, Grenoble-Gare, Isere, France

Filed Mar. 18, 1970, Ser. No. 20,611
Claims priority, application France, Mar. 20, 1969, 698,213
Int. Cl. D21f *11/00, 11/04*
U.S. Cl. 162—213 **14 Claims**

A method of continuous manufacture of a sheet or element of regular consistency, comprising the uniform depositing at high speed of a liquid, pasty or fibrous-tex-

ture product on one or more wide travelling bands, said band being deformed laterally during a part of its travel so as to follow, at least in part, the internal shape of a surface of revolution inside which the product is deposited on the band, said method comprising the distribution of



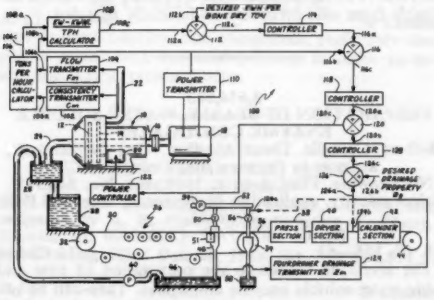
said product on said band by projecting the product under pressure from one or more nozzles located close to the axis of said surface, whereby all points of the travelling band are supplied in identically the same manner from the source of said product. The invention further covers the devices employed in carrying the method into effect.

3,654,075

CONTROL SYSTEM FOR PAPER REFINERS UTILIZING MASS RATE AND MACHINE PROPERTY COMPENSATION

Marion A. Keyes IV, South Beloit, Ill., and John A. Gudaz, Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.

Filed Dec. 10, 1969, Ser. No. 883,759
Int. Cl. B02c 7/14
U.S. Cl. 162—254 **4 Claims**



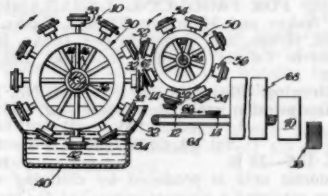
A refiner is controlled by the measurement of the refiner motor load. A feedforward loop employs data derived from both flow and consistency of the stock passing through the refiner to provide a set point for a power control loop which influences the energization of the control motor for the positioning of the axially movable beater element with respect to the stationary beater element. The flow and consistency of the stock are combined in a first calculator to provide a mass per unit time flow signal. This signal is combined in a second calculator with an actual power consumed by the refiner drive motor signal and a no-load power consumed value to provide an enregy per unit mass signal which is compared with a desired energy per unit mass to provide control for the control motor. In addition to the feedback control derived from the power control loop, an additional control loop provides further feedback action in accordance with a selected property of the paper machine itself, such as a particular characteristic of the sheet.

3,654,076

NESTED PACKAGING TRAYS PRODUCED BY A ROTARY PULP MOLDING MACHINE HAVING DIFFERENT SETS OF MOLDING DIES

Wilfred E. Hatch, China, Maine, assignor to Keyes Fibre Company, Waterville, Maine

Filed Sept. 29, 1969, Ser. No. 861,562
Int. Cl. D21j 7/00
U.S. Cl. 162—391 **2 Claims**



Apparatus for producing stack of nested articles comprises first and second sets of plural molding dies mounted in alternating fashion for shifting motion along an endless path past an article molding station. The first and second sets of plural molding dies have anti-jamming steps which are different in location from one another. Mechanical stacker places molded articles in nested fashion one above other in order articles are delivered to stacker. Article handling structure transfers articles from molding dies to stacker in same order articles are formed. Mechanical stacker produces stack of nested articles with every even numbered article therein having been molded on first set of molding dies and every odd numbered article having been molded on second set of molding dies.

3,654,077

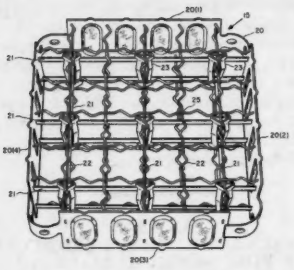
NUCLEAR REACTOR FUEL ELEMENT SPACER

James L. Lass, Wilfred T. Ross, and Dominic A. Venier, San Jose, Calif., assignors to General Electric Company, San Jose, Calif.

Continuation of application Ser. No. 648,752, June 26, 1967. This application Feb. 17, 1969, Ser. No. 802,326
Int. Cl. G21c 3/32
U.S. Cl. 176—78 **21 Claims**

This describes a spacer for resiliently retaining the elongated fuel rods of a nuclear reactor in spaced relation. The spacer comprises a peripheral support band and dividers therein forming an "egg-crate" configuration of fuel rod passages. A spring member extends into each fuel rod passage from a corner thereof. The spacer is designed to minimize the contact area of the fuel rod with the spacer, to minimize distortion and restriction of coolant flow and to minimize the amount of spacer

and retainer spring material. One embodiment is especially designed for fabrication from low neutron absorp-



tion material, such as zirconium alloys and for the automated production thereof.

3,654,078

METHOD FOR PRODUCING L-GLUTAMIC ACID

Yoshio Nakao and Masakazu Kikuchi, Osaka, Masaru Suzuki, Hyogo, and Muneharu Doi, Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

No Drawing. Filed Apr. 15, 1970, Ser. No. 28,973
Claims priority, application Japan, Apr. 15, 1969, 44/29,103
Int. Cl. C12b *1/00*
U.S. Cl. 195—28 R **15 Claims**

L-glutamic acid is produced by culturing a microorganism requiring a glycerol compound for growth and belonging to the genus Corynebacterium.

3,654,079

PROCESS FOR PRODUCING L-PHENYLALANINE BY FERMENTATION

Katsunobu Tanaka, Kazuo Oshima, Yoh Tokoro, and Mitsuyoshi Okil, Tokyo-to, Japan, assignors to Kyowa Hakko Kogyo Kabushiki Kaisha, Tokyo-to, Japan

No Drawing. Filed Mar. 28, 1969, Ser. No. 811,597
Claims priority, application Japan, Mar. 29, 1968, 43/20,030
Int. Cl. C12d *13/06*
U.S. Cl. 195—28 R **3 Claims**

This invention relates to a process for producing L-phenylalanine by fermentation comprising culturing a hydrocarbon-assimilable and tyrosine-requiring microorganism in a medium which contains hydrocarbon and nitrogen sources and accumulating significant amount of L-phenylalanine in the medium.

3,654,080

PROCESS FOR ISOMERIZING GLUCOSE TO FRUCTOSE

Barbara L. Bengtson and William R. Lamm, Clinton, Iowa, assignors to Standard Brands Incorporated, New York, N.Y.

No Drawing. Filed Jan. 5, 1970, Ser. No. 838
Int. Cl. C12b *1/00;* **C12c** *11/04;* **C12d**
U.S. Cl. 195—31 R **7 Claims**

The disclosure is directed to a process of enzymatically converting a portion of the glucose in a glucose-containing solution to fructose. Viable microorganisms which contain intracellular glucose isomerase are treated with a toxic agent to destroy at least 95 percent of the microorganisms. The treated microorganisms are cultured to promote growth, and the cellular material therefrom is incorporated into a glucose solution wherein conditions are maintained to convert a portion of the glucose to fructose.

3,654,081

STARCH LIQUEFACTION PROCESS

Richard Vernon Vance, Florissant, Mo., Arthur Orville Rock, Edwardsville, Ill., and Paul Walter Carr, St. Louis, Mo., assignors to Miles Laboratories, Inc., Elkhart, Ind.

No Drawing. Continuation-in-part of abandoned application Ser. No. 622,395, Mar. 13, 1967. This application June 1, 1970, Ser. No. 42,492
Int. Cl. C12d *13/02*
U.S. Cl. 195—31 R **8 Claims**

A process is disclosed by which starch can be easily and completely liquefied by adding calcium salts or calcium and sodium salts to an aqueous starch slurry which also preferably contains some alpha-amylase, passing the slurry mixture through a steam jet at a temperature of about 121° C. to 177° C., flash-cooling the hot mixture to about 93° C. to 102° C., adding some alpha-amylase, maintaining the mixture at this temperature for about 10–60 minutes, cooling the mixture to about 85° C., adding some alpha-amylase and maintaining the resulting mixture at this temperature until the mixture reaches a dextrose equivalent value of about 9 to 30. When crude starch is employed, the insolubles can be easily separated from the liquefied starch by filtration prior to any subsequent treatment of the liquefied starch.

3,654,082

PRODUCTION OF HIGH MALTOTETRAOSE SYRUP

Mukhtar Abdullah, Westmont, Ill., assignor to CPC International Inc.

No Drawing. Filed Feb. 10, 1969, Ser. No. 798,151
Int. Cl. C12b *1/00*
U.S. Cl. 195—31 R **31 Claims**

A process is described for converting starch which comprises subjecting a solution of a gelatinized starch selected from the group consisting of acid-modified starch, partial hydrolyzates of starch obtained by acid and/or enzyme hydrolysis of starch, and mixtures thereof, to the action of an amylase which is produced by the microorganism *Pseudomonas stutzeri* and recovering a starch conversion product. The prior or simultaneous use of a starch debranching enzyme during the conversion process is also disclosed. A novel maltotetraose syrup and dried solids obtainable from said syrup are additionally revealed.

3,654,083

PREPARATION OF STABLE, WATER-SOLUBLE ENZYME CONJUGATES

Huibert Cornelis Theus Moelker, Oss, Netherlands, assignor to Organon Inc., Orange, N.J.

No Drawing. Filed Aug. 1, 1969, Ser. No. 846,951
Claims priority, application Netherlands, Aug. 31, 1968, 6812443
Int. Cl. C07g *7/02;* **C12k** *1/00*
U.S. Cl. 195—63 **11 Claims**

The invention relates to the preparation of new and stable water-soluble enzyme conjugates. They can be obtained by the formation of covalent bonds between the enzyme and a compound containing reactive groups in the presence of one or more amino acids or peptides or mixtures thereof. These soluble conjugates are obtained in a high yield of activity and exhibit a good stability against thermic denaturation. Further they are stable in a pH range which is wider than that of the original enzyme.

3,654,084
METHOD OF PRODUCING YEAST
Sergei Vladimirovich Chepigo, Leningradsky prospekt 74, korpus 2a, kv. 9; Solomon Iosifovich Belenky, Nagatinskoe shosse 10, kv. 43; Vsevolod Sergeevich Somov, Nastasiinsky pereulok 4, kv. 8; Vasily Gerasimovich Voronkov, Nagatinskoe shosse 10, kv. 17; Mikhail Alexandrovich Belavsky, Ulitsa Goncharova 13b, kv. 22; Oleg Georgievich Korotaev, Ramenki 3, d. 76, kv. 1; Galina Sergeevna Rodionova, Ulitsa Fomichevoi 2, kv. 32; and Nikolai Spiridonovich Maximenko, Ulitsa Verkhne-Pervomaiskaya 59–35, korpus 2, kv. 81, all of Moscow, U.S.S.R.; Boris Aronovich Glazman, Ulitsa Karla Libknekhta 81, kv. 12, Krasnodar, U.S.S.R.; and Larisa Alexandrovna Belova, Donskaya ulitsa 19/25, korpus A, kv. 49; and Galina Ivanovna Vorobiova, Ulitsa Golyanovo 83, kv. 2, both of Moscow, U.S.S.R.
No Drawing. Filed June 16, 1969, Ser. No. 833,793
Int. Cl. C12c *11/10*
U.S. Cl. 195—95 4 Claims

Process for producing yeast, predominantly fodder-type yeast, by continuous cultivation of yeast in an aqueous nutrient medium containing plant tissue hydrolyzates or n-paraffins as the source of carbon and aerating the nutrient medium with air to which ozone is added in a concentration of 10^{-6} to 1.5 vol. percent.

3,654,085
STORAGE DEVICE FOR ORGAN TRANSPLANTS
Artur Valter Leopold Norr and Frits Bertil Willy Holm, Lidingo, Sweden, assignors to AGA Aktiebolag, Lidingo, Sweden
Filed Nov. 17, 1969, Ser. No. 877,217
Claims priority, application Sweden, Nov. 26, 1968, 16,077/68
Int. Cl. A61b *19/00*
U.S. Cl. 195—127 3 Claims

A pressure chamber for storing organic transplants and supplying them with oxygenated blood is provided with an oxygenator and a blood pump in the chamber. The pump is driven from a motor outside the chamber so as to avoid pressure influence on the blood, a pressure-tight transmission connecting the motor with the pump through the chamber wall.

3,654,086
BACTERIAL PROTEASE AND BACTERIAL AMYLASE COMPOSITIONS
Jack Ziffer, Milwaukee, Wis., assignor to Pabst Brewing Company, Milwaukee, Wis.
No Drawing. Filed Mar. 27, 1969, Ser. No. 811,225
Int. Cl. C12k *1/00*; C07g *7/02*
U.S. Cl. 195—63 10 Claims

One or more odorless zinc compounds, preferably zinc oxide, is mixed with bacterial protease in order to decrease the typical protease odor.

3,654,087
METHOD OF PRODUCING AMYLO-1,6-GLUCOSIDASE
Lowell E. Coker and Almerin W. Turner, Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.
No Drawing. Filed Oct. 22, 1969, Ser. No. 868,571
Int. Cl. C12d *13/10*
U.S. Cl. 195—65 7 Claims

Method of producing amylo-1,6-glucosidase, wherein an inoculum of a culture capable of producing amylo-1,6-glucosidase, is propagated without forming enzyme in an aqueous medium substantially free of maltose, maltotriose and pullulan comprising dextrose as the principal carbohydrate source and inducing the cells to form amylo-1,6-glucosidase in an aqueous medium containing maltose, maltotriose or pullulan.

3,654,088
METHOD OF PRODUCING AMYLO-1,6-GLUCOSIDASE
Lowell E. Coker and Almerin W. Turner, Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.
No Drawing. Filed Oct. 22, 1969, Ser. No. 868,572
Int. Cl. C12d *13/10*
U.S. Cl. 195—65 4 Claims

Method of utilizing amylopectin as the principal carbohydrate source for the production of amylo-1,6-glucosidase, which comprises (1) conditioning cells of a culture capable of producing amylo-1,6-glucosidase in an aqueous medium comprising a carbohydrate inducer selected from the group consisting of maltose, maltotriose, pullulan and mixtures thereof, (2) bringing together in an aqueous medium the induced cells and pasted amylopectin and (3) incubating at pH 6.0 to 8.1 to produce amylo-1,6-glucosidase, wherein the amylopectin constitutes the principal carbohydrate source in step (3).

3,654,089
PRODUCTION OF AMYLO-1,6-GLUCOSIDASE
Lowell E. Coker and Almerin W. Turner, Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.
No Drawing. Filed Oct. 22, 1969, Ser. No. 868,630
Int. Cl. C12d *13/10*
U.S. Cl. 195—65 7 Claims

Utilization of phytate filtrate and/or steep liquor as the principal nitrogenous material for the production of amylo-1,6-glucosidase, comprising (1) bringing together in an aqueous medium induced cells capable of producing amylo-1,6-glucosidase and at least one nitrogenous material selected from the group consisting of steep liquor and phytate filtrate and (2) incubating at pH 6.0 to 8.1 to produce amylo-1,6-glucosidase.

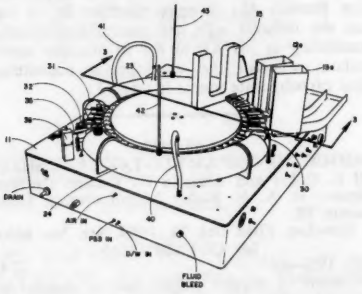
3,654,090
METHOD FOR THE DETERMINATION OF ANTIGENS AND ANTIBODIES
Antonius Hermanus Wilhelmus Maria Schuurs and Bauke Klaas van Weemen, Oss, Netherlands, assignors to Organon Inc., West Orange, N.J.
No Drawing. Filed Sept. 24, 1968, Ser. No. 762,120
Int. Cl. C12k *1/04*
U.S. Cl. 195—103.5 10 Claims

The invention relates to a method for the determination of a component of the antigen-antibody reaction, comprising the use of one component in an insolubilized form and the other one covalently linked to an enzyme. By the addition of a sample of the component to be determined the distribution of the enzyme-labelled component over the liquid and solid phase is altered. The amount of soluble or insoluble enzyme-labelled component can easily be determined in small quantities by the specific enzyme activity, said amount being a measure for the quantity of component in the sample. The invention also comprises the reagents consisting of one component in insolubilized form and the other corresponding one in enzyme-labelled form.

3,654,091
INCUBATION CHAMBER
Gerald F. Binnings, Arcadia, Theodore N. Meyer, Westminster, and Mel J. Riley, Covina, Calif., assignors to Aerojet-General Corporation, El Monte, Calif.
Original application May 9, 1968, Ser. No. 727,859, now Patent No. 3,574,064. Divided and this application Apr. 23, 1970, Ser. No. 31,097
Int. Cl. C12k *1/10*
U.S. Cl. 195—139 2 Claims

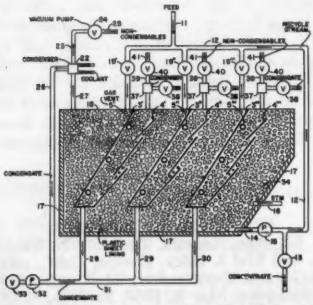
This disclosure describes apparatus for automatically processing special laboratory slides carrying specific antigenic material with samples of blood serum taken from

patients to detect the presence of specific antibodies in the serum as an indication of previous exposure to the antigen. Specifically, the disclosure describes the apparatus as applied to the fluorescent treponemal antibody (FTA) test for syphilis using an indirect fluorescent antibody technique with *T. pallidum* (Nichols strain) as the antigen. The apparatus of the invention includes a mechanism for discharging from a magazine a number of antigen carrying laboratory slides onto a rotating carrier and the dispensing of samples of patients' serum onto the laboratory slides. This is followed by the incubation of the slide carrying the previously fixed antigen and the patients'



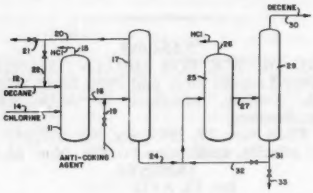
serum for several minutes to allow the reaction of any specific antibodies in the serum with the fixed antigen. The apparatus further includes means for washing to remove excess serum, means for injecting a conjugate which reacts with the human serum affixed to the antigen and carries a fluorescent tag such as fluorescein isothiocyanate. The apparatus includes means for further incubation to insure the reaction between the antigen-antibody complex and the conjugate followed by further washing and discharging of the reacted slides to an off-loading mechanism for subsequent examination under a laboratory microscope.

3,654,092
MULTIPLE-STAGE EVAPORATOR
John C. St. Clair, Box 333, R.R. 2, London, Ohio 43140
Filed Nov. 20, 1970, Ser. No. 91,511
Int. Cl. B01d *1/02, 1/26, 3/00*
U.S. Cl. 202—174 **10 Claims**



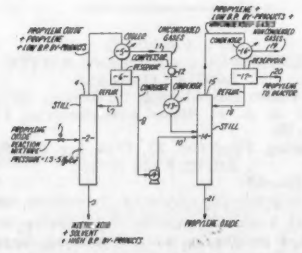
A twenty-stage vacuum evaporator is made from a series of 20 sloping sheets of polyester plastic film separated by 0.5 inch diameter pebbles. The plastic sheets of film slope at a 15° angle and are supported 8 inches apart by and in a bed of the pebbles. Pumps circulate the liquid solution evaporated over the upper surfaces of the plastic sheets of film and the liquid is evaporated by vapors contacting and condensing on the under surfaces of the plastic sheets, with each sheet dividing off a chamber that evaporates liquid at a successive lower pressure. Condensate formed by the vapors condensing on the underside of the plastic sheets is prevented from mixing with the liquid solution being evaporated by a series of short plastic sheets, placed at a smaller angle with the horizontal than the larger sheets, that catch the condensate like shingles on a house and direct the condensate into bottom outlets.

3,654,093
COKE PREVENTION IN DISTILLATION OF ALKYL CHLORIDES
Donald A. Schexnayder, 16201 Buccaneer, Apt. 228, Houston, Tex. 77058, and Donald L. Wood, 10410 Quiet Hill Road, La Porte, Tex. 77571
Filed Sept. 11, 1969, Ser. No. 857,019
Int. Cl. B01d *3/34*
U.S. Cl. 203—8 **4 Claims**



The formation of carbon solids (coke) during the physical processing of alkyl chloride-containing streams in ferrous metal apparatus such as fractionators is substantially reduced by carrying out such processing in the presence of up to about 1% by weight of lower alkylated aromatics; polymethylated benzenes and methylated napthalenes are preferred.

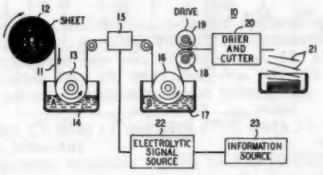
3,654,094
PROCESS FOR PURIFYING PROPYLENE OXIDE BY PLURAL STAGE DISTILLATION
Kazuo Yamagishi, Tokyo, and Osamu Kageyama and Yoshiaki Numa, Ohimachi, Japan, assignors to Daicel, Ltd., Osaka, Japan
Filed Mar. 18, 1970, Ser. No. 20,594
Claims priority, application Japan, Mar. 22, 1969, 44/21,944
Int. Cl. B01d *3/14;* **C07d** *1/08*
U.S. Cl. 203—77 **3 Claims**



A process for purifying propylene oxide from a reaction mixture containing propylene oxide, propylene, peracetic acid, acetic acid and the reaction solvent, in which the reaction mixture is distilled under a pressure of 1.3–5.0

kg./cm.^{2} so that a distillate containing propylene oxide and propylene is discharged from the column head, condensing the distillate and then subjecting the condensed distillate to a second distillation to recover propylene oxide from the bottom of the second distillation column.

3,654,095
ELECTROLYTIC PRODUCTION OF MULTICOLORED PRINTS
Donald Eldridge Koontz, Summit, Leonard Norman Schoenberg, North Plainfield, and Dennis Robert Turner, Chatham Township, Morris County, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Aug. 6, 1970, Ser. No. 61,623
Int. Cl. B21h *1/20*
U.S. Cl. 204—2 **20 Claims**



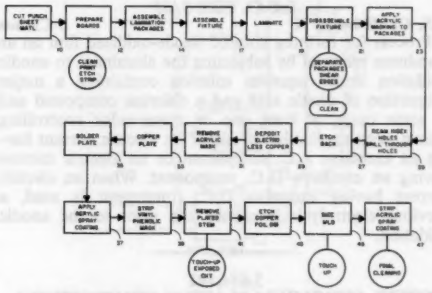
A multicolored print is produced electrolytically from a modulated electrical signal by a scanning operation. Metallic anodes of as many different compositions as colors desired, are used together with one or more color producing reagents. Red, green, and blue images are produced using anodes containing copper, platinum and iron with a single ferrocyanide reagent or using anodes containing nickel, iron and copper with a combination of alpha-benzoin oxime, a dimethylglyoxime reagent, and a ferrocyanide reagent.

3,654,096
MAKING COPPER SHEETS ELECTROLYTICALLY
Jan Versteegh, Chile, South America, assignor to The Anaconda Company
No Drawing. Filed Jan. 14, 1969, Ser. No. 791,130
Int. Cl. C23b *5/18, 7/08*
U.S. Cl. 204—12 **7 Claims**

A method is described for making pure copper sheets, such as starting sheets used in electrowinning and electrorefining of copper, by electrodeposition on a copper plate. The method involves first thoroughly wetting the surface of the copper plate with an aqueous solution of a water-soluble thiol having collecting properties in the flotation of sulfidic copper minerals. Among such polar thio compounds which are preferably used are alkyl thiocarbonates, thiocarbanilide, and alkyl and aryl dithiophosphates. The solution preferably contains about 0.5% to 20% by weight of the thiol; and preferably also contains a wetting agent. After the copper plate has been wetted with such solution, copper is electrolytically deposited thereon. When a deposit of desired thickness has been built up, it is easily stripped in sheet form from the treated copper plate.

3,654,097
METHOD OF MAKING MULTILAYER PRINTED CIRCUITS
Joseph F. Degnan, Webster, N.Y., assignor to General Dynamics Corporation
Filed July 22, 1969, Ser. No. 843,434
Int. Cl. C23b *5/48;* **B41m** *3/08;* **B44d** *1/18*
U.S. Cl. 204—15 **11 Claims**

Improved methods of fabricating multilayer printed circuit boards are described wherein at least one exposed circuit face is prefabricated before the boards are laminated together by means of a non-flowing "B" stage epoxy glass sheets and in a fixture having flowable material confined on opposite sides of the package (viz the layers to be laminated), thereby permitting the use of such non-flowing material which reduces shrinkage, improves lamination quality, maintains registration among the boards, and simplifies fixturing. The lamination packages may also



include a vinyl phenolic glass cloth layer which is laminated on one side. Also during the process an acrylic resin protective coating is applied which together with the vinyl phenolic layer, provides selectively removable masks which facilitate removal of electroless surface plating on exposed circuit faces and drilling holes through the boards. Thereafter, plated connections are provided via the holes between the circuits on the boards.

3,654,098
ELECTROCHEMICAL PROCESS OF COATING USING A FLUIDIZED BED
John Rayner Backhurst, Corbridge, Northumberland, Francis Goodridge, Ponteland, Newcastle-upon-Tyne, Raymond Ernest Plimley, Chandlersford, and Martin Fleischmann, Newcastle-upon-Tyne, England, assignors to National Research Development Corporation, London, England
No Drawing. Filed May 1, 1968, Ser. No. 725,920
Claims priority, application Great Britain, May 9, 1967, 21,557/67
Int. Cl. C23b *5/60, 5/00;* **B01k** *3/00*
U.S. Cl. 204—20 **7 Claims**

Particularly for use in a fluidised particle electrode for an electrochemical cell such as a zinc/air battery, a method of producing particles of substantially unform shape comprises electrochemically depositing surface metal on to substantially uniform particles which form a fluidised bed electrode in a plating bath.

The particles may comprise non-metallic cores which are coated with a thin metallic coating electrolessly, or by a vacuum deposition technique, before being introduced into the plating bath.

3,654,099
CATHODIC ACTIVATION OF STAINLESS STEEL
Eric De Bruyne, Deerlijk, Belgium, assignor to N.V. Bekaert S.A., Zwevegem, Belgium
No Drawing. Filed June 10, 1970, Ser. No. 45,261
Claims priority, application Great Britain, June 20, 1969, 31,369/69
Int. Cl. C23b *5/62*
U.S. Cl. 204—29 **28 Claims**

Processes for production of stainless steel articles such as, for example, stainless steel wires, strips, sheets and the like by activating the surface of a stainless steel substrate by cathodic treatment in an aqueous acid bath at high current density followed by electroplating the activated surface to provide the desired layer or layers of electroplate.

3,654,100

PROCESS OF FORMING COLORED, ANODE OXIDIZED FILM ON ALUMINUM MATERIAL

Kazuko Nagai, Yokohama, and Yoshiharu Yamada, Kawasaki, Japan, assignors to Riken Almite Industry Co., Ltd., Kawasaki, Japan

No Drawing. Filed May 25, 1970, Ser. No. 40,411
Claims priority, application Japan, May 31, 1969, 44/4,208
Int. Cl. C23f 5/02
U.S. Cl. 204—35 N 5 Claims

Process for forming colored anode-oxidized film on an aluminum material by subjecting the aluminum to anodic oxidation in an aqueous solution containing a major proportion of oxalic acid and a chlorine compound and in some cases, at least one or more color controlling agents, with application of either an electric current having an excessive A.C. component or an electric current having an excessive D.C. component. When an electric current having excessive D.C. component is used, a previous electrolysis is carried out prior to the anodic oxidation.

3,654,101

NOVEL CHROMIUM PLATING COMPOSITIONS AND PROCESSES

Fred Aoun, Madison Heights, Mich., assignor to M & T Chemicals Inc., New York, N.Y.

No Drawing. Filed Jan. 9, 1970, Ser. No. 1,874
Int. Cl. C23b 5/06
U.S. Cl. 204—51 12 Claims

In accordance with certain of its aspects, this invention relates to novel compositions and to a process for electroplating chromium plate onto a basis metal which comprises passing current from an anode to a cathode at least a portion of which contains a conductive metal layer through an aqueous acidic chromium plating bath composition containing

(1) At least one chromium compound providing hexavalent chromium ions for electroplating chromium; and

(2) Bromate ion as cooperating additive to provide increased chromium throwing power; for a time sufficient to deposit a chromium electroplate having a thickness of at least 1×10^{-5} mm.

3,654,102

METHOD OF PREPARING ELECTROLYTIC MANGANESE DIOXIDE

Thomas W. Clapper, Oklahoma City, Okla., and Martin A. Prieto, Whittier, Calif., assignors to American Potash & Chemical Corporation, Oklahoma City, Okla.

No Drawing. Filed Aug. 25, 1970, Ser. No. 66,871
Int. Cl. C23b 11/00; B01k 3/06
U.S. Cl. 204—83 5 Claims

Method of preparing manganese dioxide by the electrolysis of an aqueous solution containing sulfuric acid and manganese sulfate wherein the improvement comprises the use of an anode formed of an expanded metal of titanium, tantalum or zirconium.

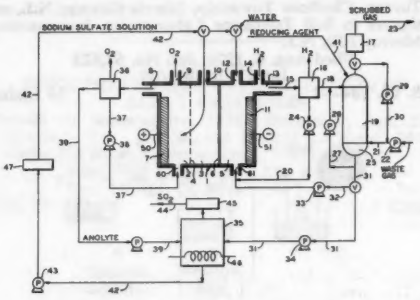
3,654,103

PROCESSES FOR CONTROLLING THE pH OF A SULFUR DIOXIDE SCRUBBING SYSTEM

Wayne A. McRae, Lexington, Mass., assignor to Ionics, Incorporated, Watertown, Mass.

Continuation-in-part of application Ser. No. 717,766, Apr. 1, 1968, now Patent No. 3,523,755. This application Aug. 3, 1970, Ser. No. 60,348
Int. Cl. B01k 1/00; C01d 7/34
U.S. Cl. 204—92 10 Claims

This invention is directed to a continuous cyclic process for the absorption of sulfur dioxide and/or nitrogen oxides (capable of oxidizing bisulfite) into solution from a gas containing minor amounts of nitrogen oxides, sulfur dioxide with or without oxygen and/or other oxidants with subsequent recovery of a concentrated sulfur dioxide gas stream. Electrolytically produced reducing agents such as sodium dithionite are added to the absorbing solution to absorb nitrogen oxides, to control the pH of the system and also to prevent loss of recoverable sulfur dioxide from the undesired oxidation of said sulfur dioxide which oxidation otherwise generally occurs within the absorber. Suitable reducing agents are those which will preferentially react with and remove dissolved oxidants present in



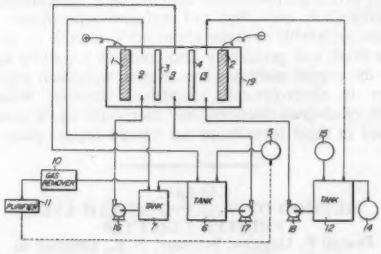
the solution thereby forming bisulfite. The reducing agent consumed may be reformed by electrolytically reducing bisulfite and/or sulfur dioxide in the cathode compartment of an electrolytic cell with the resulting reformed reducing agent recycled for additional oxidant removal. The pH of the system is controlled by adding lime and soda ash equivalent to the amount of sulfur dioxide oxidized or by crystallizing sulfate salts out of part of the anolyte bisulfate effluent from the electrolytic cells, thereby removing and recovering sulfuric acid from the system.

3,654,104

ELECTROLYSIS OF SALT SOLUTION

Mitsuo Yoshida, Hisao Kai, and Tetsuo Yamane, Nobeoka-shi, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 5, 1970, Ser. No. 8,825
Claims priority, application Japan, Feb. 15, 1969, 44/10,766
Int. Cl. B01d 59/42; B01k 1/00; C01d 1/06
U.S. Cl. 204—98 3 Claims



An aqueous solution of alkali metal halide or hydrochloric acid is electrolyzed in an electrolytic cell consisting of at least one unit cell which comprises a cathode, an anode, a cation exchange membrane, and a neutral diaphragm having a water permeability of not more than

5 cc./min. cm.² under a pressure difference of 1 kg./cm.², where the cation exchange membrane and the neutral diaphragm are juxtaposed at a distance between the cathode and the anode to form an anode compartment between the anode and the neutral diaphragm, an intermediate compartment between the neutral diaphragm and the cation exchange membrane, and a cathode compartment between the cation exchange membrane and the cathode, by passing each compartment solution at a flow velocity of at least 3 cm./sec., while keeping an inside pressure of the intermediate compartment higher than that of the anode compartment.

3,654,105

PRODUCTION OF SILICA SOLS BY ELECTROLYSIS

Henry Thomas Joseph Chilton, Llangollen, Wales, assignor to Monsanto Chemicals Limited, London, England

No Drawing. Continuation-in-part of application Ser. No. 665,733, Sept. 6, 1967, which is a continuation-in-part of application Ser. No. 631,897, Apr. 19, 1967. This application July 15, 1969, Ser. No. 842,031

Claims priority, application Great Britain, July 19, 1968, 34,520/68

Int. Cl. B01j *13/00;* **B01k** *1/00;* **C01b** *33/14*

U.S. Cl. 204—101 **10 Claims**

The present invention relates to the production of a silica sol which comprises the steps of passing an electric current between the pair of electrodes, the anode of which pair is fabricated of a silicon-containing material such as a ferrosilicon, positioned in an electrolytic cell containing a liquid medium comprising water, an alcohol such as ethanol and an electrolyte such as sulphuric acid for a sufficient period of time to form the above-described silica sol. Additional embodiments (of the present invention) cover the aqueous medium composition per se and the continuous process for preparing the silica sol.

3,654,106

ISOCYANATE-CONTAINING TELOMERS AND A PROCESS FOR THE PRODUCTION THEREOF

Kuno Wagner and Wulf von Bonin, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Nov. 6, 1968, Ser. No. 773,964

Claims priority, application Germany, Nov. 9, 1967, F 53,991

Int. Cl. C08d *1/34;* **C08g** *22/16, 22/34*

U.S. Cl. 204—159.23 **6 Claims**

Isocyanate group containing telomers are prepared by reacting ethylenically unsaturated monomers with organic isocyanates in the presence of heat, high energy radiation, peroxidic radical forming agents and/or nitrogen containing radical forming agents or combination thereof.

3,654,107

PROCESS FOR CHLORINATION OF SATURATED HYDROCARBONS

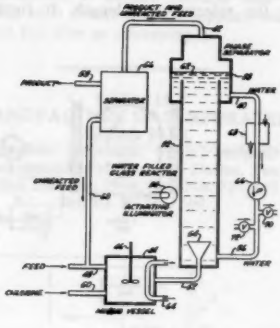
Richard C. Lindwall and Richard E. Crocker, Anaheim, Calif., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed Jan. 18, 1968, Ser. No. 703,838

Int. Cl. C07c *17/10*

U.S. Cl. 204—163 R **9 Claims**

An apparatus and process for controlling the direct reaction of chlorine with a saturated hydrocarbon wherein the hydrocarbon and the chlorine are premixed in the dark under non-reacting conditions, the hydrocarbon-chlorine mixture is dispersed as globules or droplets in a flowing aqueous medium, and the aqueous medium carrying the suspended globules is exposed to reaction-initiating light, wherein the reaction temperature is controlled by the aqueous phase and inorganic reaction products are removed into the aqueous phase along with any water



soluble inhibiting agents to permit complete reaction of the chlorine with the hydrocarbons are disclosed.

3,654,108

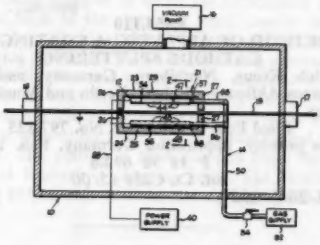
METHOD FOR GLOW CLEANING

Hugh R. Smith, Jr., Piedmont, Calif., assignor to Air Reduction Company, Incorporated, New York, N.Y.

Continuation-in-part of application Ser. No. 484,417, Sept. 1, 1965. This application Sept. 23, 1969, Ser. No. 867,113

Int. Cl. C23g *5/00;* **B08b** *5/00;* **B01k** *1/00*

U.S. Cl. 204—164 **6 Claims**



A glow cleaning method for removing contaminants from the surface of a substrate which is to be subsequently coated employs a reactive gas capable of yielding negative ions in the glow discharge which are chemically combinable with the contaminants, and an electric field accelerates these ions toward the surface to be cleaned. The contaminants are dislodged from the surface by physical bombardment and are removed by chemical reaction with the bombarding ions to produce reaction products which do not readily adhere to the substrate surface.

3,654,109

APPARATUS AND METHOD FOR MEASURING RATE IN FLOW PROCESSES

Jakob H. Hohl and Karl H. Raacke, Essex Junction, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

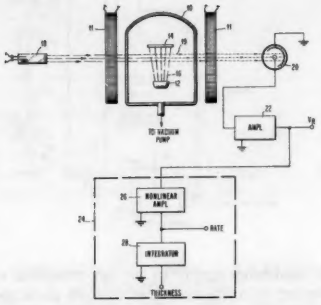
Filed Apr. 25, 1968, Ser. No. 724,179

Int. Cl. C23c *15/00*

U.S. Cl. 204—192 **26 Claims**

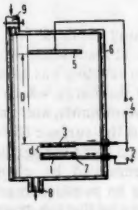
Rate, thickness, and composition of materials deposited in vapor deposition processes may be measured, even at

very low deposition rates, using the disclosed atomic absorption spectroscopy apparatus. The apparatus has a source of radiant energy having a selected wavelength absorbed by the material sought to be measured and means for measuring the total amount of radiant energy so absorbed at the selected wavelength. It further includes



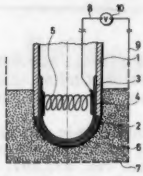
means for converting this absorption measurement to a rate and/or thickness measurement and also a composition measurement, if desired. Radiant energy in the ultraviolet light spectrum is normally employed, and the disclosed apparatus and method is particularly suited for measuring deposition parameters in the fabrication of nickel-iron magnetic films.

3,654,110
METHOD OF APPLYING A COATING BY CATHODE SPUTTERING
Friedrich Kraus, Neubiberg, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany
Filed Feb. 6, 1969, Ser. No. 797,125
Claims priority, application Germany, Feb. 12, 1968, P 16 90 692.6
Int. Cl. C23c *15/00*
U.S. Cl. 204—192 **11 Claims**



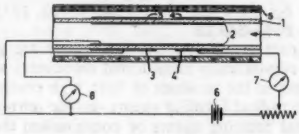
The invention relates to a method of coating a layer of inorganic, solid material upon a base by cathode sputtering. The invention is characterized by the fact that a grid or sieve-like perforated cathode, which is comprised, at least at its surface, of the material is to be deposited, is arranged between anode and substrate and is negatively biased against both. The substrate is brought so close to the cathode that the space between the two is insufficient to maintain an independent gas discharge, at the adjusted pressure and the applied voltage.

3,654,111
APPARATUS FOR THE CONTROL OF HYDROGENATION-DEHYDROGENATION PROCESS ON METAL CATALYSTS IN THE GAS PHASE
Zoltan Csuros, Jozsef Petro, Tibor Mathe, and Antal Tungler, Budapest, Hungary, assignors to Magyar Tudomanyos Akademia, Budapest, Hungary
Filed May 11, 1970, Ser. No. 36,032
Claims priority, application Hungary, May 16, 1969, MA–1,990
Int. Cl. G01n *27/46*
U.S. Cl. 204—195 **2 Claims**



A method for controlling the preparation of hydrogenation-dehydrogenation catalysts by reduction and their activation by means of hydrogen. The metal connection is fixed to a metal catalyst forming a catalyst bed, the said metal connection being a measuring electrode which is connected through a glass electrolyte to a reference electrode, and the electromotive force of the cell obtained in this way is measured.

3,654,112
DEVICE FOR MEASURING AND DOSING A GAS
Nicolaas Marinus Beekmans, Leopold Heijne, and Adrianus Teunis Vink, Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed July 17, 1968, Ser. No. 745,586
Claims priority, application Netherlands, July 20, 1967, 6710038
Int. Cl. G01n *27/46*
U.S. Cl. 204—195 **4 Claims**

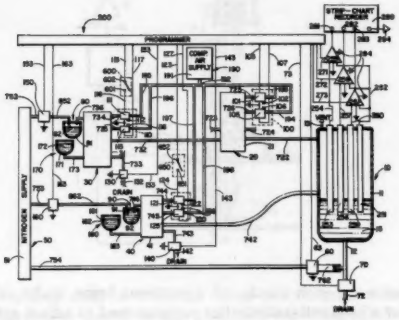


A device for measuring and controlling the composition of a gas in which there is employed a solid partition wall exhibiting a reversible reaction with the gas molecules and ion conductivity. The partition wall is provided on both sides with an electrode layer at least one of these layers being electrically interrupted.

3,654,113
PROGRAMMED FLUID SAMPLING AND ANALYSIS APPARATUS
Julius H. Bochinski, La Habra, Calif., assignor to North American Rockwell Corporation, El Segundo, Calif.
Filed Nov. 24, 1969, Ser. No. 879,055
Int. Cl. G01n *27/00, 27/28*
U.S. Cl. 204—195 R **16 Claims**

The programmed fluid sampling and analysis apparatus and method includes programmer controlled sampling of

a fluid stream in order to subject the fluid to automated analysis of the ion concentrations of the chemicals of the fluid. A flushing fluid and an electrolyte fluid are programmed through the apparatus impelled by a gas which ultimately mix in a vessel wherefrom the mixtures are analyzed by specific element-ion sensitive probes connected

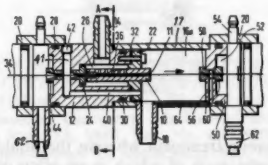


to electronic amplifying and recording equipment. A programmed analysis of each specific probe output is provided on a strip chart recorder and the ion concentrations are determined by reading the steady state values of the recorded and amplified outputs of each of the specific element-ion sensitive probes.

3,654,114
APPARATUS FOR THE TREATMENT AND TORSION-FREE TRANSPORTATION OF THIN WIRE

Omri Brandstaetter, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed July 2, 1970, Ser. No. 51,887
Claims priority, application Germany, July 9, 1969, P 19 34 818.6
Int. Cl. B01k *3/00*
U.S. Cl. 204—206 **12 Claims**

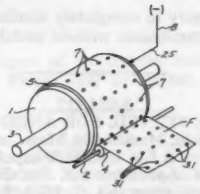


Fluid conveying device for conveying thin wire free from torsion and bending stresses including a conveying nozzle of increasing diameter from its entry to its discharge end and extending along a pressure chamber. A series of axially aligned converging wire guides are provided at the entering end and beyond the discharge end of the conveying nozzle, to guide the wire to pass along the center of the conveying nozzle. Fluid under pressure supplied to the pressure chamber enters the conveying nozzle through a series of passageways leading through the wall of the nozzle and spaced about and along the nozzle. Fluid under pressure entering the conveying nozzle through the passageways flows towards the larger diameter end of the nozzle, and exerts a propelling force on the wire, propelling the wire through the nozzle from the smaller and out the larger diameter end of the nozzle. Any number of aligned conveying nozzles may be provided and connected in aligned relation with respect to each other and each nozzle may be supplied with treating liquid to treat the wire as conveying it.

3,654,115
MANUFACTURE OF PERFORATED METAL FOIL

Rene N. Langlais, Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 30, 1968, Ser. No. 787,440
Int. Cl. B23p *1/00*
U.S. Cl. 204—216 **1 Claim**



A rotatable mandrel forms an electrode for electroplating, being formed by an insulating cylinder surrounded by an attached closely fitting cylindrical sleeve of metal through which holes are formed. In the holes are masses of hardened nonconductive filler material forming slugs, the outer surfaces of which are coextensive with the cylindrical form of the sleeve. A small crevice forms an outline in the cylindrical sleeve surface around each slug. Each crevice contains a jelly-like insulating substance disposed according to said outline. The mandrel is caused to rotate in an electrolytic metal-plating bath. The jelly-like substance is selected so as not to contaminate the bath. Electrolytic deposition forms a perforated plated skin on the sleeve. The plating is then stripped from the sleeve and moved through a cleaning bath. The result is an accurately perforated, uniform untorn metal foil strip.

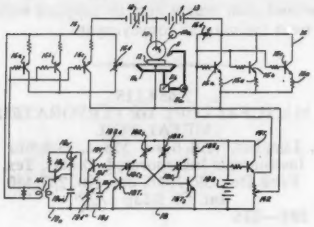
3,654,116
ADAPTIVE ION-CONTROL SYSTEM FOR ELECTROCHEMICAL MACHINING

Kiyoshi Inoue, 100 Sakato, Kawasaki, Kanagawa, Tokyo, Japan

Continuation-in-part of application Ser. No. 714,251, Mar. 19, 1968. This application Aug. 1, 1969, Ser. No. 849,261
Claims priority, application Japan, Aug. 7, 1968, 43/55,924; Apr. 19, 1969, 44/30,466
Int. Cl. B23p; C23b *5/76*
U.S. Cl. 204—224 **29 Claims**

Method of and apparatus for electrochemically machining a workpiece wherein the machining electrolyzing current passes in the form of steep-wavefront pulses of one polarity spaced by intervals and during these intervals, opposite-polarity pulses are applied across the tool electrode and the workpiece with a pulse width at most equal to the duration of the respective interval but preferably of a shorter duration and with an adjustable lag. Also, adaptive control for electrochemical machining in which passivation conditions in the machining gap is directed by sensing the deviation in an electrical machining parameter, a condition of the electrolyte, or a condition of servo feed of the tool or workpiece toward the other, whereby the

reverse-polarity or opposite-polarity pulse has its amplitude, timing and direction adjusted in accordance with



the levels necessary to completely eliminate such passivation or ion contamination without unduly increasing tool electrode wear.

3,654,117

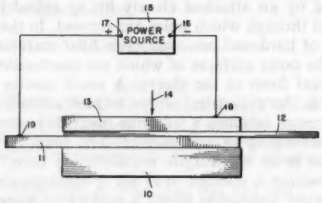
ELECTRODE STENCIL FOR ANODIC PRINTING

Gerhart P. Klein, Manchester, Mass., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Continuation of application Ser. No. 594,123, Nov. 14, 1966. This application Oct. 7, 1969, Ser. No. 866,102

Int. Cl. C23b *5/76*; B01k *3/06*

U.S. Cl. 204—224 **8 Claims**



A printing system is provided comprising a film-forming metal stencil printing surface having an image formed on the surface that is electronically conductive. Means are provided for holding electro sensitive paper in contact with the printing surface, and a power source is utilized to provide current flow from the electrode stencil to the electrode means to develop the image on the sheet of photosensitive paper.

3,654,118

ELECTROLYSIS

Tadeusz Ryszard Selwa, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

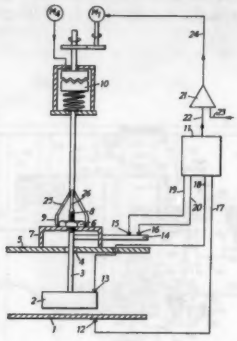
Original application Mar. 6, 1967, Ser. No. 620,889, now Patent No. 3,476,660, dated Nov. 4, 1969. Divided and this application May 6, 1969, Ser. No. 840,576

Claims priority, application Great Britain, Mar. 23, 1966, 12,854/66

Int. Cl. B23p *1/12*; B01k *3/00*

U.S. Cl. 204—225 **13 Claims**

A method of adjusting sequentially each anode-cathode gap of a working mercury-cathode electrolytic cell by carrying out automatically in appropriate sequence (1) selection of an anode-cathode gap for adjustment, (2) positioning a servo-operated anode-adjusting tool over the appropriate anode, (3) bringing the tool into and out of engagement with an adjusting means on the anode support, (4) measuring the electrical conductance of the anode-cathode gap, (5) adjusting the anode setting to a predetermined value of gap-conductance, and repeating the



sequence on each anode, all operations being under control of a sequential controller programmed to adjust automatically all the anode-cathode gaps in the cell, and arrangement of apparatus therefor.

3,654,119

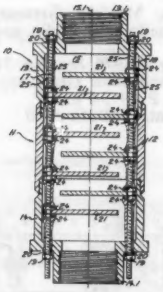
OLIGODYNAMIC TREATMENT OF LIQUIDS

Gordon F. White, Vancouver, and Adam R. Wilkinson, Burnaby, British Columbia, Canada, assignors to White Water International Ltd., Vancouver, British Columbia, Canada

Filed Oct. 12, 1970, Ser. No. 79,987

Int. Cl. B01k *3/00, 1/00*

U.S. Cl. 204—228 **4 Claims**



Oligodynamic treatment wherein the liquids are passed over electrodes each of which is an alloy of copper and silver. The electrodes are opposite poles of an electrical circuit having means for changing polarity of the electrodes at predetermined intervals.

3,654,120

ELECTROLYTIC CELL INCLUDING BIPOLAR ELECTRODES WITH RESIN-IMPREGNATED HOLES IN THE ELECTRODE BODY

Georg Messner, Munich, Germany, assignor to Nora International Company, Panama City, Panama

Filed July 29, 1969, Ser. No. 845,701

Int. Cl. B01k *3/04*; C22d *1/02*

U.S. Cl. 204—255 **11 Claims**

Describes a cell and process for the electrolysis of hydro-halogen solutions composed of a plurality of unit

cells clamped together in a filter press arrangement, wherein each unit cell consists of a graphite electrode and a frame disposed peripherally on the electrode, a diaphragm between each unit cell, each bipolar graphite electrode having a plurality of holes between the active faces of the graphite electrodes with the pores in the graphite in the vicinity of the holes being impregnated

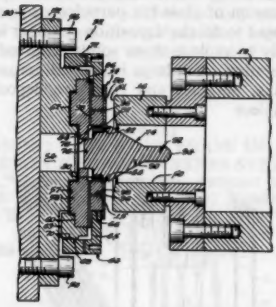
or sealed with a resin to form a continuous barrier through the center of the electrode which is effective in minimizing loss of current due to the migration of ionic currents through the electrodes. The frame is provided with a plurality of separate exit ports for separately discharging halogen and hydrogen, together with the spent hydro-halogen solution.

3,654,121
ELECTROLYTIC ANODE
Carl D. Keith, Summit, Alfred J. Haley, Jr., Florham Park, and Robert M. Kero, Cranford, N.J., assignors to Engelhard Minerals & Chemicals Corporation, Newark, N.J.
No Drawing. Filed Dec. 23, 1968, Ser. No. 786,438
The portion of the term of the patent subsequent to Dec. 28, 1988, has been disclaimed
Int. Cl. B01k *3/04*
U.S. 204—290 F **3 Claims**

An improved anode for the electrolysis of brines is comprised of a corrosion resistant valve metal substrate, a thin porous adherent exterior coating of silica, and between the substrate and exterior coating a thin layer of ruthenium oxide.

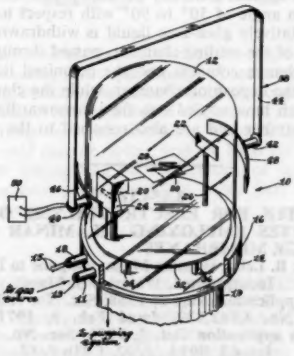
3,654,122
WORKPIECE HOLDING FIXTURE FOR ELECTROLYTIC SHAPING APPARATUS
Lynn A. Williams, Winnetka, Ill., assignor to Anocut Engineering Company, Elk Grove Village, Ill.
Application Mar. 15, 1967, Ser. No. 633,650, which is a Continuation-in-part of application Ser. No. 228,401, Oct. 4, 1962. Divided and this application June 27, 1969, Ser. No. 837,234
Int. Cl. C23b *5/70*
U.S. Cl. 204—297 **9 Claims**

Apparatus for electrolytically machining a workpiece by means of an electrically conductive electrode where the electrolyte is pumped under substantial pressure through the electrode and between the working face of the electrode and the surface being electrolytically machined on a workpiece held in a fixture which provides a support for the back of the workpiece held thereagainst by the pressure of the electrolyte and has ports and passages to drain away any electrolyte tending to accumulate between the workpiece and the workpiece support; the fixture provides electrical contact for the positive side of the current supply to the workpiece, and it is fitted with means to hold the workpiece in position, such as a central pilot member for annular workpieces, and periphery sup-



ports for all shapes of workpieces including ammeter workpieces. The fixture may be rotated, if desired.

3,654,123
SPUTTERING
Dennis G. Hajzak, Rochester, N.Y., assignor to The Bendix Corporation
Filed Sept. 25, 1968, Ser. No. 762,436
Int. Cl. C23c *15/00*
U.S. Cl. 204—298 **5 Claims**

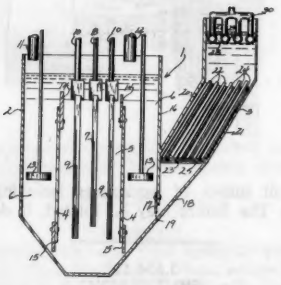


This disclosure shows means to achieve controlled coatings by sputtering. By incorporating in a conventional sputtering system means to form a controllable sheet of plasma and means to cause a predetermined, continuous relative movement between the plasma and the substrate, control of deposition of the target material is achieved. This technique may be used to achieve uniformity over wider surface areas and may also be used to achieve controlled non-uniformity of deposited coatings.

3,654,124
APPARATUS FOR ELECTROPHORETIC DEPOSITION
Donald I. Lusk, Mequon, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.
Filed Jan. 31, 1969, Ser. No. 795,440
Int. Cl. B01k *5/02;* **C23b** *13/00*
U.S. Cl. 204—299 **15 Claims**

An apparatus for the electrophoretic deposition of glass including a casing which defines a deposition chamber and

a settling chamber which communicates with the deposition chamber. The metal article to be coated is made an anode in an electrical circuit and is located in the deposition chamber along with a cathode. Glass slip, which is a water suspension of glass frit particles, clays and mill additions, is used to fill the deposition chamber and is added continuously to replace those solids removed during the coating operation. A voltage is applied across the circuit and the glass particles and clays are deposited on the metal workpiece.



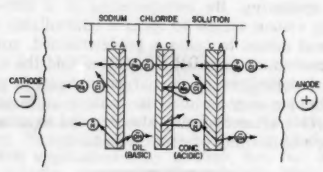
In addition, a provision is made to continuously deionize the liquid or water phase of the glass slip. The glass frit particles settle out in the settling chamber on a series of spaced, generally parallel plates which are located at an angle of 50° to 90° with respect to the horizontal. Relatively glass-free liquid is withdrawn from the upper end of the settling chamber, passed through a series of ion exchange columns and the deionized liquid is returned to the deposition chamber, while the glass frit particles, which have settled out, flow downwardly from the settling chamber and are also returned to the deposition chamber.

3,654,125

APPARATUS FOR ELECTRODIALYSIS OF ELECTROLYTES EMPLOYING BILAMINAR ION EXCHANGE MEMBRANES

Frank B. Leitz, Weston, Mass., assignor to Ionics, Incorporated, Watertown, Mass.

Original application Aug. 5, 1968, Ser. No. 750,312, now Patent No. 3,562,139, dated Feb. 9, 1971. Divided and this application Oct. 5, 1970, Ser. No. 77,976
Int. Cl. B01d *13/02;* **C02b** *1/82*
U.S. Cl. 204—301 **3 Claims**



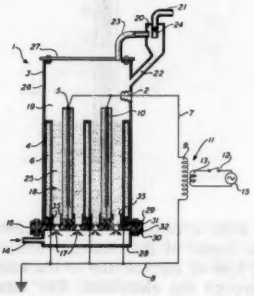
Method and apparatus for the deionization of electrolyte solutions wherein alternatingly oriented anion-cation bilaminate ion-exchange membranes define the chambers of a multi-chamber electrodialysis cell and wherein the anion exchange laminae of each of said membranes bound the salt diluting chambers and the cation exchange laminae bound with the salt concentrating chambers. A direct electric current is passed transversely through all of said chambers and membranes which current is periodically reversed.

3,654,126

FLUIDIZED BED OZONE GENERATOR

Ralph McNabney, Morristown, N.J., and Derk Th. A. Huibers, Naarden, Netherlands, assignors to Air Reduction Company, Incorporated, New York, N.Y.

Filed Nov. 20, 1969, Ser. No. 878,494
Int. Cl. C01b *13/12*
U.S. Cl. 204—314 **7 Claims**



Apparatus and method are disclosed for high efficiency electrical conversion of oxygen to ozone. An oxygen-containing gas is passed upwardly through a particulate dielectric contained between spaced electrode surfaces, whereby a fluidized bed is established consisting of a suspension of said dielectric particles in the streaming gas. Means are present for simultaneously maintaining a silent electrical discharge across the spaced electrodes and through the fluidized bed. The bed acts as a highly effective heat sink and also promotes the presence of high-frequency components in the current waves passing between electrodes, as a result of which increased electrical efficiency and increased ozone output is enabled in the conversion process.

3,654,127

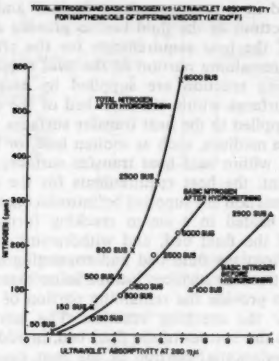
PROCESS FOR PREPARING HIGH VISCOSITY HYDROREFINED CABLE OIL

Ivor W. Mills, Media, and Glenn R. Dimeler and William A. Atkinson, Jr., West Chester, Pa., and James P. Hoffman, Wilmington, Del., assignors to Sun Oil Company, Philadelphia, Pa.

Filed Aug. 18, 1969, Ser. No. 850,778
Int. Cl. C10g *7/00;* **H01b** *3/22*
U.S. Cl. 208—14 **14 Claims**

In a process wherein a topped naphthenic crude is heated and flash distilled under vacuum in a first distillation step to remove gas oil and lubricating oil fractions and a heavy residuum containing asphaltic and high molecular weight naphthenic acid components is obtained,, an improvement comprises (a) subjecting said heavy residuum to vacuum distillation in a second distillation step at a pressure lower than that to which the residuum was subjected in said first distillation step; (b) separating from the second distillation step a heavy distillate having an initial ASTM D–1500 color greater than 7.5, SUS viscosity at 100° F. in the range of 8100–14,000 SUS, a 260 UVA greater than 12.0 and containing high molecular weight naphthenic acids; (c) catalytically hydrogenating said heavy distillate at a temperature in the range of 500–775° F., with H_2 of 50–100% purity, and from 800–3000 p.s.i. of hydrogen at the reactor inlet (at total pressures from 800–6000 p.s.i.g.) at a fresh feed liquid hourly

space velocity (LHSV) of from 0.1–8.0; and (d) recovering hydrogenated oil having an initial ASTM D–1500 color no greater than 2.5, a viscosity in the range of 5000–12,000 SUS at 100° F., an API gravity at 60° F.


TOTAL NITROGEN AND BASIC NITROGEN VS ULTRAVIOLET ABSORPTIVITY
FOR NAPHTHENIC OILS OF DIFFERING VISCOSITY (AT 100°F)
TOTAL NITROGEN AFTER HYDROREFINING
BASIC NITROGEN AFTER HYDROREFINING
BASIC NITROGEN BEFORE HYDROREFINING
NITROGEN (ppm)
ULTRAVIOLET ABSORPTIVITY AT 280 mμ

in the range of 15.5–18.5, a refractive index in the range of 1.51–1.53, a 260 UVA less than 10.0, a flash point above 425° F., a pour point greater than 10° F. and which contains at least 40 wt. percent gel aromatics.

3,654,128
DEWAXING OF LUBRICATING OILS
Robert A. Woodle, Nederland, Tex., assignor to Texaco Inc., New York, N.Y.
No Drawing. Filed Dec. 24, 1969, Ser. No. 888,050
Int. Cl. C10g *43/08*
U.S. Cl. 208—33 **4 Claims**

Lubricating oil distillates containing both paraffin wax and microcrystalline wax, are dewaxed in a process combining catalytic hydrodewaxing and centrifuge dewaxing.

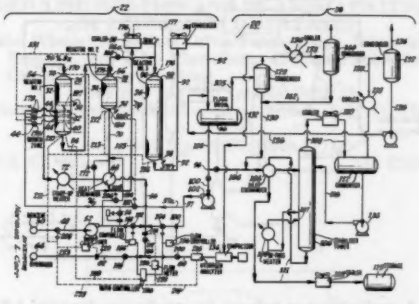
3,654,129
HYDROREFINING OF COKE-FORMING HYDROCARBON DISTILLATES
Herman S. Bloch, Skokie, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
No Drawing. Continuation-in-part of application Ser. No. 742,503, July 5, 1968. This application Apr. 20, 1970, Ser. No. 30,313
Int. Cl. C10g *9/16, 23/00*; C23f *14/00*
U.S. Cl. 208—48 **7 Claims**

An olefin polymerization inhibitor is added to an unsaturated coke-forming hydrocarbon distillate prior to subjecting the same to hydrorefining, to retard the thermal polymerization chains sufficiently to insure formation only of soluble polymers and thereafter hydrogenating said soluble polymers in a hydrorefining (hydrogluation zone. Suitable inhibitors are selected from the group consisting of phenols, aromatic amines and thiophenols, and are employed in an amount of from 0.005% to 1.0% by weight of the hydrocarbonaceous charge stock.

3,654,130
PREPARATION OF HIGH V.I. LUBE OILS
Alexis Voorhies, Jr., and Glen P. Hamner, Baton Rouge, La., assignors to Esso Research and Engineering Company
No Drawing. Filed Nov. 10, 1969, Ser. No. 875,509
Int. Cl. C10g *23/02, 37/06*
U.S. Cl. 208—57 **4 Claims**

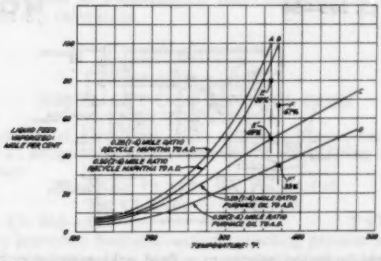
High boiling hydrocarbon feeds are converted to high V.I. lube oils in high yields by hydrotreating in a first stage over a hydrogenation catalyst under conditions adapted to saturate the polynuclear aromatic hydrocarbons therein and then hydrocracking in a second stage over a faujasite-base catalyst, such as Pd on H-faujasite, under conditions such that less than 15% conversion to products boiling below 650° F. occurs and polynuclear naphthenes are converted to single ring naphthenes, and paraffins are isomerized to branch-chain structure.

3,654,131
MAINTAINING A GASEOUS PHASE IN A HYDROCARBON HYDROGENATION SYSTEM
Norman L. Carr, Pittsburgh, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.
Filed Dec. 15, 1969, Ser. No. 885,066
Int. Cl. C07c *5/10*; C10g *23/00*
U.S. Cl. 208—57 **16 Claims**



A petrochemical plant is disclosed comprising reactor means including a catalyst capable of inducing a catalytic exothermic reaction therein, means for controlling the inlet and outlet temperatures of said reactor means, means for supplying reactants including a normally liquid reactant to said reactor means, and the basis for the control means for maintaining the temperature of said reactants above the dew point thereof in every part of said reactor means.

3,654,132
HYDROGENATION PROCESS IN PRESENCE OF A HIGH BOILING DILUENT
Robert D. Christman, Penn Hills, and Joel D. McKinney, Indiana Township, Allegheny County, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.
Filed Dec. 19, 1969, Ser. No. 886,554
Int. Cl. C10g *23/04*
U.S. Cl. 208—57 **9 Claims**



A process for the selective hydrogenation of diolefins over monoolefins in an aromatic distillate stream in the

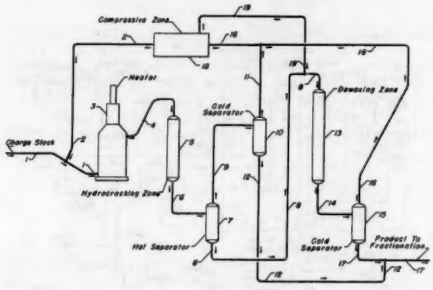
presence of a noble metal catalyst at a temperature below about 350 to 400° F. at which temperature said aromatic distillate is at least partially in the liquid phase, in the presence of a diluent hydrocarbon having a boiling range above said aromatic distillate which increases the proportion of said aromatic distillate in the liquid phase and thereby both inhibits solid polymer formation in said process and provides improved temperature control.

3,654,133

DEWAXED LUBRICATING OIL PRODUCTION

Robert K. Olson, Hinsdale, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed June 23, 1970, Ser. No. 48,969
Int. Cl. C10g *23/02, 37/02*
U.S. Cl. 208—59 **7 Claims**



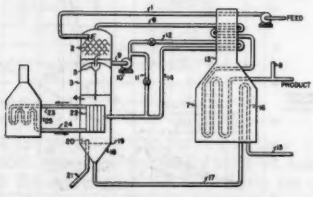
A multiple-stage process for producing dewaxed lubricating oil base stocks having viscosity indices greater than about 100. The hydrocarbonaceous charge stock is initially processed in a hydrocracking zone selectively controlled to convert relatively low viscosity index, condensed-ring hydrocarbons to a relatively high viscosity index product. The product effluent from this first zone is separated, at substantially the same temperature and pressure, producing a principally liquid phase containing the heavier waxy components. This waxy distillate serves as a charge stock to the second reaction zone which is selectively controlled to convert the waxy constituents, by way of both hydrocracking and hydroisomerization, into lower-boiling hydrocarbon products.

3,654,134

PROCESS COMBINATION OF FLUID COKING AND STEAM CRACKING

Guy B. Wirth, Florham Park, and Charles E. Jahnig, Rumson, N.J., assignors to Esso Research and Engineering Company

Filed Sept. 19, 1969, Ser. No. 859,490
Int. Cl. C10b *55/10*; C10g *37/02*
U.S. Cl. 208—54 **26 Claims**



This invention relates to a fluid coking-steam cracking furnace combination process for producing coke and gaseous hydrocarbons from a heavy hydrocarbon feedstock wherein a substantial portion of the heat requirements for the endothermic-cracking reaction in the fluid coking vessel are met by passing steam through a furnace, preferably a steam cracking furnace, and thereafter introducing said heated steam into the bottom of the fluidized bed of the coker vessel. In one embodiment, steam is first heated in a steam cracking furnace and introduced into the bottom of the fluid bed to provide a substantial portion of the heat requirements for the cracking reaction. The remaining portion of the heat requirements for the cracking reaction are supplied by employing heat transfer surfaces within the fluid bed of the coker vessel. Heat is supplied to the heat transfer surfaces by passing a hot molten medium, such as molten lead, or hot combustion gases within said heat transfer surfaces. In another embodiment, the heat requirements for the endothermic cracking reaction are supplied by introducing steam, which has been heated in a steam cracking furnace, into the bottom of the fluid bed, and withdrawing carbonaceous material from the fluid bed and contacting said material with heat transfer surfaces located in an external heat exchanger to provide the remaining portion of the heat required for the cracking reaction. The introduction of steam into the bottom of the fluid bed, in addition to supplying a substantial portion of the heat requirements to the fluid bed, functions to fluidize the bed and to provide the diluent medium for the vaporized hydrocarbons recovered from the fluid bed coking zone which are then passed to a steam cracking furnace to produce the low molecular weight unsaturated products.

3,654,135

PROCESS FOR OBTAINING AROMATIC HYDROCARBONS FROM OILS AND/OR THEIR RESIDUES, RICH IN AROMATIC HYDROCARBONS, AND HAVING A HIGH CONTENT OF UNSATURATED COMPOUNDS

Otto Wegener, Mulheim-Speldorf, Rudolf Oberkobusch and Gerd Collin, Duisburg-Meiderich, and Maximilian Zander and Herbert Buffleb, Castrop-Rauxel, Germany, assignors to Rutgerswerke Aktiengesellschaft, Frankfurt am Main, Germany

No Drawing. Filed Dec. 9, 1969, Ser. No. 883,591
Claims priority, application Germany, Dec. 19, 1968, P 18 15 568.5
Int. Cl. C10g *37/08*; C07c *7/14*
U.S. Cl. 208—71 **6 Claims**

Aromatic compounds, e.g., naphthalene, phenanthrene, anthracene, durene, are obtained in increased yields from oils and/or residues rich in aromatic compounds and having a high content of unsaturated compounds, by pretreating said oils or residues by a thermal treatment at increased temperature in the range of 300–500° C. and at an excess pressure of 4–30 atmospheres, subjecting the pretreated material to fractional distillation and recovering the aromatic hydrocarbons from their fractions by cooling and crystallization.

The aromatic compounds are thereby recovered in increased yields and increased purity.

3,654,136

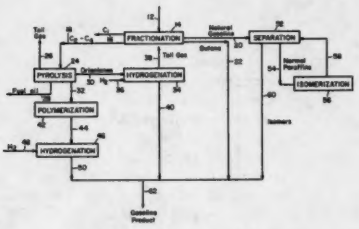
PRODUCTION OF GASOLINE FROM NATURAL GAS

Daniel Milsom, Hightstown, N.J., assignor to Cities Service Oil Company, Tulsa, Okla.

Filed Nov. 26, 1969, Ser. No. 880,220
Int. Cl. C10g *37/08*
U.S. Cl. 208—71 **4 Claims**

A process for the production of gasoline from natural gas in which a C_2 to C_4 natural gas liquids fraction is converted to polyolefins boiling below about 400° F. and the polyolefins are then hydrogenated to form gasoline blending stock. A natural gasoline fraction comprising

mostly C_5 to C_7 hydrocarbons is treated by isomerization to convert at least about 95% of the normal paraffins contained therein to isoparaffins. The isomer product and



isomers originally contained in the natural gasoline fraction are then blended with the hydrogenated polyolefin product.

3,654,137
RISER CRACKING OF SOLVENT EXTRACTED GAS OIL

Edward J. Dober, Pittsburgh, and Robert W. Koch, Verona, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed July 23, 1970, Ser. No. 57,587
Int. Cl. C10g *11/18*
U.S. Cl. 208—87 **8 Claims**

A gas oil is passed through a solvent extraction zone to separate an aromatics-rich extract fraction from an aromatics-lean raffinate fraction, each having a boiling range substantially as wide as the feed gas oil. A fluidized mixture of zeolite and nonzeolite cracking catalyst is continuously passed upwardly through an elongated cracking reactor which does not contain added hydrogen. The aromatics-lean raffinate fraction is continuously charged to the reactor at a position close to the bottom thereof while the aromatics-rich extract fraction is continuously charged to the reactor at a position more remote from the bottom thereof.

3,654,138
METHOD OF STARTING UP A HYDROCRACKING PROCESS

James F. Mosby, Griffith, Ind., and James C. Koller, Jr., Chicago, Ill., assignors to Standard Oil Company, Chicago, Ill.

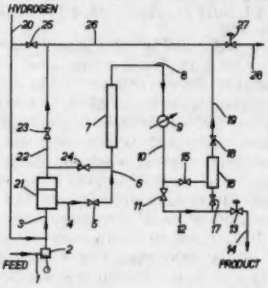
No Drawing. Continuation-in-part of abandoned application Ser. No. 572,224, Aug. 15, 1966. This application June 17, 1970, Ser. No. 47,167
Int. Cl. C10g *13/02, 23/00*
U.S. Cl. 208—111 **25 Claims**

Start-up method comprises contacting the hydrocracking catalyst with a hydrogen-containing gas at a pressure between about 0 and about 2,500 p.s.i.g. and a temperature between about 400° F. and about 850° F.; cooling the catalyst to minimize conversion of hydrocarbons; contacting the catalyst with a first preliminary hydrocarbon feedstock having low concentrations of nitrogen, sulfur and aromatics in a manner that will not deleteriously affect the catalyst; increasing the temperature in the reaction zone to obtain conversion of the first preliminary hydrocarbon feedstock to lower-boiling hydrocarbons; stopping the flow of the first preliminary hydrocarbon feedstock; and contacting the catalyst with a principal petroleum hydrocarbon feedstock. The hydrocracking catalyst comprises a hydrogenation component on a co-catalytic support. The preferred support comprises ultrastable, large-pore crystalline aluminosilicate material suspended in a porous matrix of amorphous silica-alumina. The preferred hydrogenation component comprises a mixture of cobalt oxide and molybdenum trioxide.

3,654,139
DESULPHURISATION AND DE-AROMATISATION OF PETROLEUM DISTILLATES

John Winsor, 58 Giffard Drive, Farnborough, Hampshire, England, and John Carruthers, 42 Sandalwood Ave., Chertsey, Surrey, England

Filed July 5, 1968, Ser. No. 742,733
Claims priority, application Great Britain, July 11, 1967, 31,770/67
Int. Cl. C10g *23/00*; C07c *5/10*
U.S. Cl. 208—89 **14 Claims**



A process is disclosed in which a 60–250° C. distillate containing up to 2% wt. sulphur and up to 25% wt. aromatics is catalytically desulphurised with hydrogen in a first stage to convert the major proportion of the sulphur to hydrogen sulphide. Hydrogen sulfide is removed, the fraction is contacted with supported elemental nickel to remove remaining sulphur in a second stage without liberation of hydrogen sulphide. without aromatics hydrogenation, and without hydrocracking, and the desulphurised fraction is hydrogenated over supported elemental nickel in a third stage.

3,654,140
NOVEL CAT CRACKING OIL FEED INJECTOR DESIGN

Jacob Griffel, New York, N.Y., and Ivan Mayer, Summit, N.J., assignors to Esso Research and Engineering Company

Filed Aug. 12, 1970, Ser. No. 63,130
Int. Cl. C10g *11/00, 11/18*
U.S. Cl. 208—113 **7 Claims**

An improved fluidized catalytic cracking process is provided which comprises feeding a substantially liquid hydrocarbon oil feedstock to at least one feed injection zone of a fluidized catalytic cracking reaction zone, concurrently

feeding steam to said injection zone in a volumetric ratio of steam to liquid hydrocarbon ranging from about 3 to about 75, thereby imparting to the resulting mixture an exit velocity relative to the fluidized catalyst of at least about 100 feet per second, whereby the oil feedstock is essentially completely atomized forming droplets less than about 350 microns in diameter.

3,654,141
CATALYTIC CRACKING OF SHALE OIL OVER ZEOLITE CATALYST

Harrison C. Maryland, Lockport, Ill., assignor to Atlantic Richfield Company, New York, N.Y.

No Drawing. Filed Jan. 8, 1969, Ser. No. 789,937
Int. Cl. C10g *11/02, 11/18*
U.S. Cl. 208—120 **8 Claims**

A process for catalytically cracking of oils derived from oil shale which contain high amounts of nitrogen, i.e., over about 1 percent is disclosed. The catalytic cracking is conducted at temperatures of about 975° F. up to about 1200° F. At these temperatures the adverse effects of nitrogen poisoning of the catalyst are substantially negated.

3,654,142
REGENERATION OF PLATINUM-RHENIUM REFORMING CATALYST

Vincent J. Moravec, Jr., 1315 Nasa Road 1, Apt. 263 77058, and William K. Meerbott, 3006 Winslow 77025, both of Houston, Tex.

Filed July 29, 1970, Ser. No. 59,246
Int. Cl. B01j *11/02, 11/18;* **C10g** *35/06*
U.S. Cl. 208—140 **6 Claims**

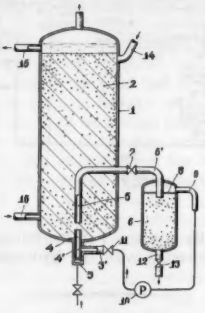
The activity and stability of a deactivated reforming catalyst containing a platinum group metal and rhenium are restored to that of fresh catalyst by (1) removing substantially all carbon from the catalyst; (2) contacting the catalyst at about 900° F. with a non-reducing gas containing halogen, steam and oxygen until about 85% wt. of the desired halide content is added; (3) discontinuing the use of steam and oxygen from the last-mentioned step until the halogenation is completed; and (4) drying and reducing the catalyst with a hydrogen-containing gas; then reusing the catalyst in a reforming process. Preferably, the catalyst is halogenated to a level about 20% greater than that of fresh catalyst. It is also preferred that the catalyst then be dried with a non-reducing gas at about 900° F. until the water content in the exit gas is below 150 p.p.m.v. followed by reducing the metallic oxides by contact with a hydrogen-containing gas at 700–900° F.

3,654,143
METHOD AND APPARATUS FOR WITHDRAWING SOLID CATALYST PARTICLES

Yoshihide Kodera, Kawasaki-shi, Jun Kato and Kazuo Shimada, Tokyo, Morio Suzuki, Fujisawa-shi, Hidetaka Ohse, Soka-shi, and Satoshi Ohshima and Yasunori Kuriki, Tokyo, Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Filed Dec. 29, 1969, Ser. No. 888,470
Claims priority, application Japan, Dec. 28, 1968, 44/95,945
Int. Cl. C10g *23/06*
U.S. Cl. 208—146 **4 Claims**

In catalyst in a reaction tank having a material feed pipe at the lower portion thereof and a product-taking-out-pipe at the upper portion thereof, a discharge nozzle and a suction nozzle are provided, the discharge nozzle being connected to the discharge side of a pump provided outside the reaction tank and the suction nozzle being connected to the suction side of the pump, respectively. When the pump operates, a reaction liquid is discharged from the discharge nozzle and then sucked into the suction nozzle along with catalyst. Thus, catalyst is recovered in a catalyst recovery tank provided between the suction nozzle and the pump, and the reaction liquid is circulated from the pump to the suction nozzle through the discharge nozzle. Either the discharge nozzle or the suction nozzle

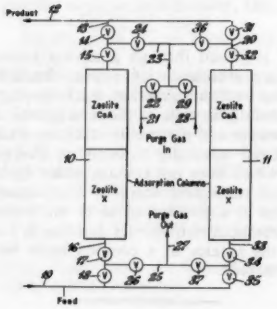


is, as occasion demands, slid so as to make contact with the other. Thus, the inner surface of the suction nozzle is rinsed by circulating a reaction liquid, and thereby catalyst adhering to the inner surface of the said suction nozzle is removed.

3,654,144
PURIFICATION OF LIQUID HYDROCARBONS CONTAINING CARBONYL SULFIDE

John Joseph Collins, Katonah, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed June 10, 1970, Ser. No. 45,117
Int. Cl. C10g *29/22*
U.S. Cl. 208—245 **6 Claims**

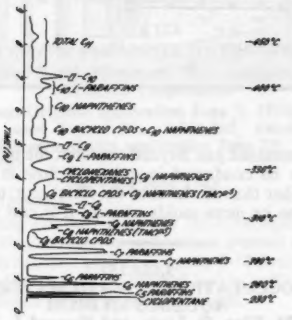


COS is removed as an impurity from hydrocarbon feedstocks by selective adsorption of the COS from the mixture thereof with the hydrocarbon in the liquid state using zeolite A which has been to some degree calcium cation exchanged. The liquid hydrocarbon stream containing sulfur compounds is passed through a bed of the modified zeolite A, and advantageously if other sulfur-containing impurities of larger molecular dimension are also present, the liquid hydrocarbon stream is also passed through a bed of molecular sieve having a pore size large enough to adsorb benzene.

3,654,145
DISCOVERY IN SEPARATION OF HYDROCARBONS

John Vincent Brunnock, deceased, late of Frimley, England, by Pamela Mary Brunnock, legal representative, Frimley, and Leonard Arthur Luke, Ashford, England, assignors to the British Petroleum Company Limited, London, England

Filed Feb. 17, 1969, Ser. No. 800,376
Claims priority, application Great Britain, Feb. 21, 1968, 8,407/68; July 24, 1968, 35,237/68
Int. Cl. C07c *7/12*
U.S. Cl. 208—310 **13 Claims**

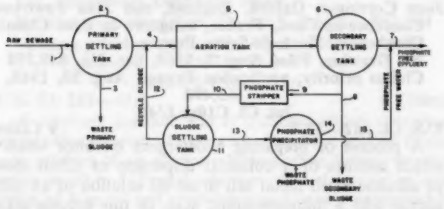


Hydrocarbon mixtures containing paraffinic and naphthenic hydrocarbons differing in carbon number by at least 2 are separated into fractions consisting substantially of naphthenic or paraffinic hydrocarbons of the same carbon number by passing the mixture in the vapour phase, together with an inert carrier gas, through a column of a molecular sieve having pore diameters greater than 5 A. The column is temperature programmed within the range 40–250° C. above the average boiling point of the highest carbon number components present and the fractions are recovered from the bed as successive effluents.

3,654,146
AEROBIC REMOVAL OF PHOSPHATE FROM ACTIVATED SLUDGE

Gilbert V. Levin, Chevy Chase, Md., and George J. Topol, Reston, Va., assignors to Biospherics Incorporated, Rockville, Md.

Filed Feb. 3, 1971, Ser. No. 112,179
Int. Cl. C02c *1/06*
U.S. Cl. 210—6 **4 Claims**

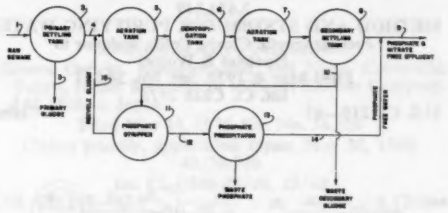


There is disclosed an activated sludge sewage treatment process in which phosphates are removed from phosphate-enriched sludge by aerating the phosphate-enriched sludge with an oxygen-containing gas. During aeration, the organisms in the sludge, after consuming the available food substrate, go into endogenous respiration, consuming much of their own cellular material. Thus, the aeration serves to reduce the volume of sludge as well as to cause the organisms in the sludge to release phosphate. A phosphate-enriched supernatant liquor is formed on settling. The sludge, having a reduced phosphate content, is separated from the phosphate-enriched supernatant liquor and at least a portion thereof is recycled for mixing with influent sewage material in an activated sludge sewage treatment process. The resultant mixed liquor is aerated to reduce the BOD content and to cause the organisms present to take up phosphate and phosphate-enriched sludge is separated from the mixed liquor to provide a substantially phosphate-free effluent.

3,654,147
NITRATE REMOVAL FROM SEWAGE

Gilbert V. Levin, Chevy Chase, and George J. Topol, Silver Spring, Md., assignors to Biospherics Incorporated, Rockville, Md.

Filed Mar. 16, 1971, Ser. No. 124,716
Int. Cl. C02c *1/06*
U.S. Cl. 210—6 **3 Claims**



There is disclosed an activated sludge sewage treatment process in which the nitrogen content of raw sewage is removed. In the process, raw sewage is mixed with activated sludge to form a mixed liquor and the mixed liquor is aerated at a rate sufficient to convert ammonia present in the sewage to nitrate. The mixed liquor is then passed to a zone wherein it is maintained under conditions in which there is insufficient oxygen present to satisfy the needs of the microorganisms in the mixed liquor. This causes the microorganisms to break down the nitrate and to fulfill their oxygen needs by obtaining oxygen from the nitrate. Nitrogen gas is formed in the process and is evolved from the system.

There is also disclosed a process whereby the phosphate content of sewage is also reduced. In this embodiment, conditions are controlled so that the sludge which is withdrawn from the mixed liquor contains a substantial portion of the phosphate content. The final effluent which is passed out of the system is substantially free of phosphate and nitrate.

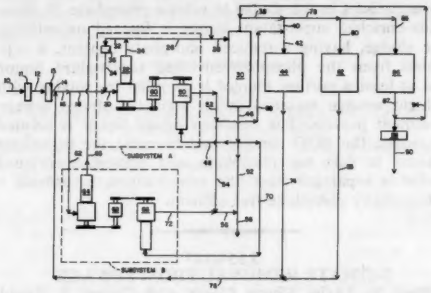
3,654,148
LIQUID PURIFICATION SYSTEM

William E. Bradley, New Hope, Pa., assignor to Puredesal, Inc., Levittown, Pa.

Filed Sept. 28, 1970, Ser. No. 75,940
Int. Cl. B01d *13/00, 31/00*
U.S. Cl. 210—23 **11 Claims**

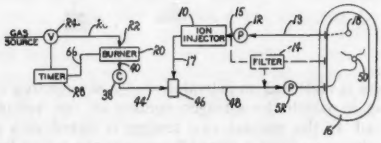
Liquid purification is accomplished using the same pressure dialysis or reverse osmosis membrane in desalination or fluid processing apparatus to achieve two or more successive stages of purification. By operating the apparatus using a particular time sequence of fluid pressures and/or

solutions having different concentrations and chemical compositions, the apparatus and particularly the reverse



osmosis membrane are effectively rejuvenated for substantially continuous utilization.

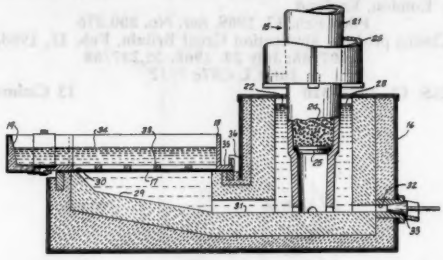
3,654,149
METHOD AND SYSTEM FOR PURIFYING WATER
Joel Hedgpeth, Clovis, Calif., assignor to Huebner & Worrel
Filed May 4, 1970, Ser. No. 34,261
Int. Cl. C02b *1/18*
U.S. Cl. 210—61 **7 Claims**



An improved method and system for purifying water, particularly that of swimming pools, contaminated by the presence of micro-organisms such as bacteria, algae, and like organic matter, and characterized by steps and means for introducing oxygen into the water to be purified in the presence of water soluble catalytic metallic ions, for achieving an oxidation of the contaminant, and for achieving an introduction of carbon dioxide into the water at a rate sufficient to establish and maintain the water at a suitable pH, whereby the metallic ions are held in solution and continuously made available to act as a catalyst in the oxidation process.

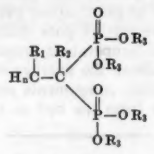
3,654,150
METHOD FOR FILTERING MOLTEN METAL
Anthony Garth Eccles, Arvida, Quebec, Canada, assignor to Alcan Research and Development Limited, Montreal, Quebec, Canada
Filed Aug. 8, 1969, Ser. No. 848,597
Int. Cl. B01d *37/04*
U.S. Cl. 210—69 **2 Claims**

Molten metal such as aluminum is filtered (e.g. for casting) by passing it through a woven mesh filter which is maintained entirely submerged in the molten aluminum. The filter in one form comprises plural contiguous layers of glass cloth stretched across the upstream side of a rigid flat grid disposed substantially horizontally in a confined path for conducting a flow of the molten aluminum, and the flow is advanced upwardly through the filter from the under side thereof. Ahead of the filter, the molten aluminum may be conducted through suitable means for removing entrained gas. Beyond the filter, the molten aluminum may be conducted in quiescent flow at a uniform level (higher than the level of the filter), e.g. to the upper end of one or more molds wherein it is cast into ingots.



3,654,151
DEFLOCCULATION OF SOLID MATERIALS IN AQUEOUS MEDIUM
Thomas M. King, St. Louis, and Howard L. Vandersall, Ballwin, Mo., assignors to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Apr. 13, 1970, Ser. No. 27,981
Int. Cl. B01j *13/00;* **C04b** *33/12;* **C10m** *3/38*
U.S. Cl. 252—8.5 C **4 Claims**

Ethane diphosphonates having the formula



wherein R_1 and R_2 are hereinafter defined and R_3 is hydrogen or a metal ion and n is an integer having a value of 1 or 2, are disclosed as deflocculating agents in aqueous vehicles or systems containing finely divided solid materials such as oil well drilling muds.

3,654,152
PROCESS FOR MAKING DETERGENT INHIBITING ADDITIVES
Jean Corringer, Oxford, England, and Jean Fourreau, Caudebec-en-Caux, France, assignors to Esso Chimie, Courbevoie, Hauts-de-Seine, France
No Drawing. Filed Aug. 7, 1969, Ser. No. 848,350
Claims priority, application France, Aug. 20, 1968, 163,490
Int. Cl. C10m *1/46*
U.S. Cl. 252—32.7 **9 Claims**

A process of preparing a detergent inhibitor additive which consists of a colloidal dispersion of alkali metal or alkaline earth metal salt in an oil solution of an alkyl phenol and a thiophosphonic acid. In this process alkali metal base or alkaline earth metal base is treated with CO_2 in a mixture of alkyl phenol and oil and a very small amount of thiophosphonic acid. Base is added several times followed by CO_2 and finally with thiophosphonic acid.

3,654,153

CUTTING FLUID FOR COLD WORK

Jury Ivanovich Nikitin, Krasnopolskaya ulitsa 11/13, kv. 41; Sergei Mikhailovich Sokhin, Krasnopolskaya ulitsa 11/13, kv. 29; and Boris Vakulovich Pogorely, Radomyshlskaya ulitsa 25, kv. 77, all of Kiev, U.S.S.R.

No Drawing. Filed Oct. 20, 1969, Ser. No. 867,945

Int. Cl. C10m *1/20, 1/28*

U.S. Cl. 252—42.1 2 Claims

A water-base cutting fluid for cold work, particularly for metal grinding, which contains sodium carbonate and an addition of sodium carboxymethyl cellulose $[C_6H_7O_2(OCH_2COONa)_3]_n$.

3,654,154

ESTERS OF PHOSPHORODITHIOATES

Milton Braid, Westmont, N.J., assignor to Mobil Oil Corporation

No Drawing. Original application June 3, 1968, Ser. No. 733,815, now Patent No. 3,544,465, dated Dec. 1, 1970. Divided and this application June 25, 1970, Ser. No. 49,984

Int. Cl. C10m *1/48*

U.S. Cl. 252—46.6 5 Claims

Lubricating oils and fuels are inhibited against oxidation by adding to them an antioxidant amount of a product made by reacting an O,O-diorgano-S-(2-hydroxyalkyl) phosphorodithioate with a thionyl halide, sulfuryl halide, organo sulfonyl halide or a sulfate ester.

3,654,155

ESTERS OF PHOSPHORODITHIOATES

Milton Braid, Westmont, N.J., assignor to Mobil Oil Corporation

No Drawing. Original application June 3, 1968, Ser. No. 733,815, now Patent No. 3,544,465, dated Dec. 1, 1970. Divided and this application June 25, 1970, Ser. No. 49,985

Int. Cl. C10m *1/48*

U.S. Cl. 252—46.7 12 Claims

Novel esters of O,O-diorgano-S-(2-hydroxyalkyl) phosphorodithioates are excellent antioxidants and corrosion inhibitors in industrial fluid compositions. Of particular interest are those phosphorodithioates which have been reacted with a boron-containing compound.

3,654,156

LUBRICANTS FOR COLD ROLLING AND MANUFACTURING THE SAME

Yoshio Ishii and Shizuyoshi Sakai, Nagoya-shi, Nobuo Fukuda and Shoji Shimada, Kitakyushu-shi, Kikuro Kurokawa, Nishinomiya-shi, and Rokuji Suzuki, Osaka-fu, Japan, assignors to Daido Chemical Industry Co., Ltd., Higashi-ku, Osaka-shi, Japan

No Drawing. Filed Feb. 20, 1969, Ser. No. 801,164

Claims priority, application Japan, Feb. 23, 1968, 43/11,613

Int. Cl. C10m *1/26*

U.S. Cl. 252—49.5 6 Claims

A lubricant for cold roll is disclosed which comprises an addition product of an epoxy compound and an oxidation product of an aliphatic hydrocarbon having an acid value of 30 to 110; said addition product having an acid value of 0 to 30 and containing said epoxy compound in the molecule in an amount sufficient to reduce at least 60 percent of the acid value of said oxidation product; and said oxidation product of the hydrocarbon being prepared by contacting at 100 to 180° C. an aliphatic hydrocarbon having 15 to 55 carbon atoms with molecular oxygen.

3,654,157

LUBRICANT COMPOSITIONS

Gerassimos Frangatos, Westmont, N.J., assignor to Mobil Oil Corporation

No Drawing. Filed July 15, 1970, Ser. No. 55,261

Int. Cl. C10m *1/46*

U.S. Cl. 252—49.9 9 Claims

Lubricants are stabilized against oxidation by adding an antioxidant amount of a copolymer of a dialkyl hydrocarbylphosphonate and an arylimino dialkanol.

3,654,158

NONCORROSIVE FUELS AND LUBRICATING OILS

John D. Newkirk, Downers Grove, Ill., assignor to Nalco Chemical Company, Chicago, Ill.

No Drawing. Filed Dec. 22, 1969, Ser. No. 887,434

Int. Cl. C10m *1/32, 1/44;* C10l *1/22*

U.S. Cl. 252—49.9 1 Claim

A method of inhibiting corrosion in hydrocarbon systems which comprises adding from 0.01–100 p.p.m. of bis-1,3-alkylamino-2 propanol or phosphorylated bis-1,3-alkylamino-2 propanol.

3,654,159

PIEZOELECTRIC CERAMICS

Hiromu Omichi, Kanagawa-ken, and Norio Kobayashi, Tokyo, Japan, assignors to Mitsumi Electric Company, Ltd., Tokyo, Japan

Filed May 18, 1970, Ser. No. 38,316

Claims priority, application Japan, May 21, 1969, 44/38,940

Int. Cl. C04b *35/46, 35/48*

U.S. Cl. 252—62.9 3 Claims

A piezoelectric ceramic composed of a basic composition expressed by the general formula

$$Pb_mMg_n(Ti_xZr_ySn_z)O_3$$

where the fractions m and n are respectively 0.80 to 0.99 and 0.01 to 0.20 in atom ratio and the fractions x, y and z are respectively 0.42 to 0.80, 0 to 0.40 and 0.05 to 0.42 in molar ratio, CeO_2 is added to said basic composition in an amount of 0.1 to 1.5 percent by weight relative to the latter, and Cu is added in the form of its single substance, oxide or salt to said basic composition and CeO_2 in an amount of 0.04 to 0.80 percent by weight with respect to the total amount of said basic composition and CeO_2.

3,654,160

PIEZOELECTRIC CERAMICS

Tomeji Ohno, Masao Takahashi, Tsuneo Akashi, and Norio Tsubouchi, Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Continuation-in-part of application Ser. No. 688,431, Dec. 6, 1967, now Patent No. 3,487,091, dated Dec. 30, 1969. This application July 10, 1969, Ser. No. 840,682

Claims priority, application Japan, July 12, 1968, 43/49,408

The portion of the term of the patent subsequent to Dec. 30, 1986, has been disclaimed

Int. Cl. C04b *35/46, 35/48*

U.S. Cl. 252—62.9 3 Claims

Piezoelectric ceramics are provided consisting essentially of a solid solution of $Pb(Fe_{1/2}Sb_{1/2})O_3$, $PbTiO_3$ and $PbZrO_3$, where up to 25 atom percent of Pb may be replaced by at least one of Ba, Sr and Ca, and manganese oxide in the amount of 0.10 to 3.0 weight percent in the form of MnO.

3,654,161
FERROMAGNETIC MATERIAL

John W. Geus, Geleen, Netherlands, assignor to Stamicarbon N.V., Heerlen, Netherlands

Filed Jan. 5, 1970, Ser. No. 577
Claims priority, application Netherlands, Jan. 4, 1969, 6900169
Int. Cl. C04b *35/00*
U.S. Cl. 252—62.56 8 Claims

The present invention concerns a process for the preparation of a ferromagnetic material which is precipitated in a finely divided form onto a carrier material suspended in a solution containing the elements to be precipitated. The carrier material is generated in the liquid in which the precipitation of the ferromagnetic material will be carried out, by injecting a dissolved compound of the carrier material to be formed into the agitated liquid in which the carrier material is practically insoluble. An alkaline solution of silica is injected into the liquid, whose pH value is lower than 7, an acidic solution of metal ions from which the carrier material must be built up is injected into the liquid, whose pH value ranges between 4 and 7, or a solution of the elements from which the carrier material must be built up is injected in a readily hydrolysable form in a water-miscible solvent, into water as the liquid. The metal ions used are ions of aluminium, titanium, tin or thorium, or mixtures thereof, or use is made of hydrolysable chlorides such as $SiCl_4$, $AlCl_3$, $TiCl_4$, $SbCl_3$ or $SnCl_4$, or mixtures thereof, dissolved in methyl alcohol, ethyl alcohol or acetone and hydrolysable esters of inorganic acids and alcohols, such as $Al(OC_2H_5)_3$, $Sb(i\text{-}C_3H_7O)_3$, dissolved in methyl alcohol, ethyl alcohol or acetone.

3,654,162
FERRIMAGNETIC IRON GARNET HAVING LARGE FARADAY EFFECT

Carl F. Buhrer, Oyster Bay, N.Y., assignor to GTE Laboratories Incorporated

No Drawing. Filed Oct. 1, 1970, Ser. No. 77,346
Int. Cl. C04b *35/00;* G02f *1/22*
U.S. Cl. 252—62.57 5 Claims

A ferrimagnetic iron garnet having the general formula

$$\{Bi_{3-2x-y}Ln_yCa_{2x}\}[Fe_2](Fe_{3-x}V_x)O_{12}$$

where Ln is a trivalent rare earth element and x and y are selected to provide both a large Faraday rotation and a thermally induced magnetic compensation point. The garnet is particularly applicable to magneto-optical memories in which both the read-in and read-out processes are optically controlled.

3,654,163
COBALT FERRITE MAGNETIC POWDER FOR TAPE RECORDING

Yoshimi Makino and Shigetaka Higuchi, Kanagawa-ken, Iwao Kamiya, Tokyo, and Yoshikazu Masuya, Kanagawa-ken, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 25, 1969, Ser. No. 802,031
Claims priority, application Japan, Feb. 27, 1968, 43/12,175
Int. Cl. C04b *35/32*
U.S. Cl. 252—62.63 1 Claim

Improved cobalt ferrite magnetic powders suitable for application to magnetic recording techniques, and containing controlled amounts of zinc, magnesium, cadmium, or calcium, or mixtures of two or more of these metals to improve the storage characteristics of the tape.

3,654,164
DRILLING FLUIDS

Russell L. Sperry, Ojai, Calif., assignor to Petroleum Solids Control, Inc., Long Beach, Calif.

No Drawing. Continuation of application Ser. No. 716,552, May 27, 1968, which is a continuation-in-part of application Ser. No. 588,627, Oct. 21, 1966. This application June 3, 1970, Ser. No. 41,754
Int. Cl. C10m *3/22*
U.S. Cl. 252—8.5 A 6 Claims

Drilling mud additive compositions are provided which, when added to drilling mud systems, cement the clay cuttings from the drilling operation and prevent their disintegration while at the same time control the viscosity of the drilling fluid. These compositions, which display cohered inhibition against hydratable shales or "gumbo" clays, are characterized by a combination of (1) a copolymer of equimolar amounts of maleic anhydride with alkyl vinyl ether, in which the alkyl contains from 1 to 4 carbon atoms, having a specific viscosity of from 1.3 to about 6 at 1% by weight concentration in methyl ethyl ketone at 25° C., and (2) a water-soluble inorganic salt in which the cation is either sodium, potassuim, rubidium and cesium or a mixture of sodium and potassium and in which the anion is either a halide, carbonate, bicarbonate, sulfate, sulfite, sulfide, sulfamate, nitrate, nitrite, chromate, dichromate, molybdenate and vanadate and the ratio of said copolymer to the said inorganic salt ranging from about 1:25 to 3:1.

3,654,165
TELEPHONE CLEANER-SANITIZER

Stanley Charles Bryant and Kenneth H. Mohlhenrich, Baltimore, Md., assignors to said Bryant and to Denis T. Lynch, Reisterstown, Md., fractional part interest to each

No Drawing. Filed Sept. 10, 1970, Ser. No. 71,268
Int. Cl. C11d *3/48, 17/00*
U.S. Cl. 252—90 7 Claims

A cleaner-sanitizer specifically for wiping application to telephone instruments, including a fast-acting, penetrative, quick-drying bacteriocidal detergent solution, which leaves a safe, active residue, comprised of selected proportions of sodium lauryl sulfate, dimethyl sulfone, isopropanol, and iodine, in solution; use of the above in combination with a lint-free wiper is also disclosed.

3,654,166
DETERGENT COMPOSITIONS

Hans-Werner Eckert, Dusseldorf, and Arnold Heins, Hilden, Rhineland, Germany, assignors to Henkel & Cie GmbH, Dusseldorf, Postfach, Germany

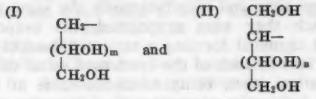
No Drawing. Continuation-in-part of application Ser. No. 656,136, July 26, 1967. This application Aug. 2, 1968, Ser. No. 749,596
Claims priority, application Germany, Aug. 14, 1967, H 63,601; May 8, 1968, P 17 67 413.4
The portion of the term of the patent subsequent to Jan. 25, 1989, has been disclaimed
Int. Cl. C11d *3/30;* D06m *13/38, 13/40*
U.S. Cl. 252—117 9 Claims

Detergent compositions comprising (a) from 20 to 90 wt. percent of at least one surfactant selected from the group of anionic, zwitterionic and non-ionic surfactants, and (b) from 10 to 80 wt. percent of, as textile softener, an N-alkyl-N-acyl-N-polyhydroxyalkyl compound of the formula:

$$R_1\text{—}N(Z)\text{—}CO\text{—}R_2$$

wherein R_1 is alkyl having 10 to 22 carbon atoms, which can be interrupted by an ether oxygen in the vicinity of

the nitrogen atom, R_2 is alkyl having 7 to 21 carbon atoms, R_1 and R_2 together containing from 23 to 39 carbon atoms and Z is a polyhydroxyalkyl having one of the following formulae:



wherein *m* has a value of 3 or 4 and *n* has a value of 2 or 3.

3,654,167

WASHING POLYMERS

Harold S. Akrongold and Rochelle Akrongold, both of 39 Cathay Road, East Rockaway, N.Y. 11518

No Drawing. Continuation-in-part of application Ser. No. 601,330, Dec. 13, 1966. This application Dec. 23, 1969, Ser. No. 887,753

Int. Cl. C11d *3/30, 9/38, 17/00*

U.S. Cl. 252—119 **44 Claims**

A hydrophilic gel of a polymeric fat acid polyamide and a diethanolamide of a fatty acid or a branched chain fatty acid for use as a detergent and in detergent type soaps.

3,654,168

DETERGENT COMPOSITION CONTAINING AMORPHOUS SODIUM SILICATE, AND METHOD OF WASHING FABRIC

Conrad J. Gaiser, 24 66th Place, Long Beach, Calif. 90803

No Drawing. Continuation-in-part of application Ser. No. 815,990, Apr. 14, 1969, which is a continuation-in-part of application Ser. No. 654,230, July 18, 1967, now Patent No. 3,450,494, dated June 17, 1969. This application July 28, 1969, Ser. No. 845,531

The portion of the term of the patent subsequent to June 17, 1986, has been disclaimed

Int. Cl. C11d *3/08, 3/30, 7/14*

U.S. Cl. 252—135 **3 Claims**

A detergent composition comprises amorphous sodium silicate having a burr-like particle structure which provides a highly colloidal dispersion in water for effective soil suspension, thus precluding pollution of the water effluent by phosphate heretofore employed for such purpose. A water softening chelating agent, and a surfactant to loosen soil from fabric are included in the composition.

3,654,169

METHOD OF SCALE INHIBITION USING PHOSPHONATE DERIVATIVES OF ISOCYANURIC ACID

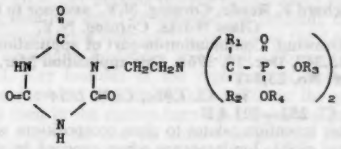
Edwin A. Matzner, Kirkwood, and Robert S. Mitchell, Webster Groves, Md., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Jan. 11, 1971, Ser. No. 105,708

Int. Cl. C02b *5/06;* **C07d** *55/38*

U.S. Cl. 252—180 **11 Claims**

The precipitation of scale-forming salts in an aqueous system is inhibited by adding either stoichiometric or substoichiometric amounts to said system of derivatives of isocyanuric acid of the general formula



wherein R_1 and R_2 are hereinafter defined and R_3 and R_4 are each hydrogen or a metal ion.

3,654,170

PROCESS OF INHIBITING SCALE USING MIXTURES OF PYROPHOSPHATES AND DITHIOPHOSPHORIC ACIDS

Alfred Eugene Woodson, Festus, Mo., assignor to Petrolite Corporation, Wilmington, Del.

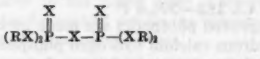
No Drawing. Filed Dec. 18, 1969, Ser. No. 886,376

Int. Cl. C23f *14/02*

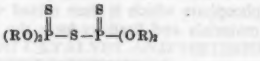
U.S. Cl. 252—181 **12 Claims**

Pyrophosphates, or mixture of pyrophosphates with the O,O-disubstituted dithiophosphoric acids, are particularly useful as scale inhibitors for aqueous systems.

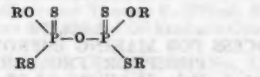
The pyrophosphates employed herein contain both oxygen and sulfur, of the formula



where X is oxygen or sulfur such as those of the formula



and



where R is other than a lower alkyl group (i.e. containing less than seven carbon atoms) and preferably a higher alkyl (i.e. at least six carbons), phenol, etc., and most preferably an oxyalkylated radical. Pyrophosphates are prepared by reacting P_2S_5 with the appropriate alcohol and continuing the reaction to convert the O,O-disubstituted dithiophosphoric acid initially formed to the pyrophosphate. The resulting product usually contains the O,O-disubstituted dithiophosphoric acid in addition to the pyrophosphate.

3,654,171

WATER AND METAL OXIDES OR HYDROXIDES AS DISPERSANTS FOR CLAY-THICKENED GREASES

Robert E. Emond, Mooretown, Ontario, and Alcide C. Horth, Sarnia, Ontario, Canada, assignors to Esso Research and Engineering Company

No Drawing. Filed June 4, 1969, Ser. No. 830,519

Int. Cl. C10m *5/26*

U.S. Cl. 252—30 **13 Claims**

Clay-thickened greases which are water resistant, shear stable, and noncorrosive to copper are prepared by combining a major amount of lubricating oil, 3 to 20 wt. percent of an oleophilic clay grease thickener and a dispersing agent comprising 1.0 to 12 wt. percent of a Group I, II, III, IV, VII, or VIII metal oxide or hydroxide and 1 to 15 wt. percent of water, said water including free water and/or water of hydration. The water can subsequently be left in the grease or can be later removed or reduced by dehydration.

3,654,172
TERBIUM ACTIVATED RADIOLUMINESCENT SILICATE GLASSES
Richard F. Reade, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 785,347, Dec. 19, 1968. This application Mar. 26, 1970, Ser. No. 23,041
Int. Cl. C03c; C09k *1/54*
U.S. Cl. 252—301.4 F 5 Claims

This invention relates to glass compositions which emit strong, visible luminescence when exposed to such ionizing radiations as X-rays, gamma-rays, or cathode rays. In particular, this invention relates to glasses within the alkali metal-alkaline earth metal-silica composition field which are activated by terbium to emit strong, visible luminescence when exposed to X-radiations having energies ranging from 50–120 kilovolts (kv.), such as are commonly encountered in medical radiography practice.

3,654,173
PROCESS FOR MAKING IMPROVED PHOSPHATE PHOSPHORS FROM MONETITE
Martha J. B. Thomas, Winchester, Ernest A. Dale, Hamilton, and Keith H. Butler, Marblehead, Mass., assignors to GTE Sylvania Incorporated
No Drawing. Continuation-in-part of application Ser. No. 819,949, Apr. 28, 1969. This application Apr. 14, 1971, Ser. No. 134,027
Int. Cl. C09k *1/36*
U.S. Cl. 252—301.4 P 4 Claims

Improved phosphors are made by controlled heating of anhydrous calcium hydrogen phosphate particles, the particles being maintained in agglomeration-preventing motion throughout the heating process, to form calcium pyrophosphate which is then mixed with other phosphor raw materials and fired to form the phosphor.

3,654,174
PROCESS FOR MAKING IMPROVED PHOSPHATE PHOSPHORS FROM BRUSHITE
Ernest A. Dale, Hamilton, and Martha J. B. Thomas, Winchester, Mass., assignors to GTE Sylvania Incorporated
No Drawing. Continuation-in-part of application Ser. No. 819,409, Apr. 25, 1969. This application Apr. 14, 1971, Ser. No. 134,084
Int. Cl. C09k *1/34*
U.S. Cl. 252—301.4 P 6 Claims

An improved form of $Ca_2P_2O_7$ for phosphors is made by precipitating particulate $CaHPO_4 \cdot 2H_2O$ from a solution, washing the precipitated powder, removing most of the water from the wet powder to provide a fairly free flowing material and carefully heating the material at a temperature sufficient to convert it to $Ca_2P_2O_7$, the particles being maintained in agglomeration-preventing motion throughout the heating process. The $Ca_2P_2O_7$ is then mixed with other phosphor raw materials and fired to form the phosphor.

3,654,175
METHOD OF GENERATING STABLE FOGS
George L. Henderson, Seattle, Wash., assignor to Applied Technology Corporation, Seattle, Wash.
No Drawing. Filed Dec. 30, 1968, Ser. No. 788,026
Int. Cl. C09k *3/30*
U.S. Cl. 252—305 11 Claims

Disclosed herein is a method of generating stable water mists or "fogs" particularly useful in reducing the risk of frost damage to growing crops. Steam, or preferably a gaseous mixture of steam and combustion gases is passed through a liquid layer of an evaporation retarding chemical such as n-hexadecanol. At the temperature of the gaseous mixture a quantity of the evaporation retarding chemical is vaporized proportional to its vapor pressure at that temperature. The gaseous mixture of steam and chemical vapors or steam, combustion gases and chemical vapors pass upward into the atmosphere where the steam and chemical vapors condense together at substantially the same time and in substantially the same proportions at which they were evaporated, the evaporation retarding chemical forming a saturated monolayer around the surface of each of the condensed water droplets. The combustion gases, being noncondensable at the atmospheric ambient temperature, pass into the atmosphere. Preferably, steam is generated by burning an air-fuel mixture in close proximity to a body of water and ejecting the hot gases, principally carbon dioxide and nitrogen, directly into the water to heat the same and generate steam.

3,654,176
COMPOSITION AND PROCESS FOR MAKING STABLE AQUEOUS SOL OF SYNTHETIC SILICATE
Barbara Susan Neumann and Keith Geoffrey Sansom, Redhill, England, assignors to Laporte Industries Limited, London, England
No Drawing. Filed June 2, 1970, Ser. No. 42,860
Claims priority, application Great Britain, June 10, 1969, 29,216/69
Int. Cl. B01j *13/00*
U.S. Cl. 252—313 R 12 Claims

Compositions are described containing a synthetic silicate, having a structure similar to that of clay minerals of the smectite type, a peptizer and a small amount of a cation for which the ratio Z/r^2 is greater than 2.0×10^{16} where Z is the valency of the cation and r is its radius. The compositions may be formulated with water to give sols of improved stability against gelling.

3,654,177
EMULSIFIER COMPOSITION
John T. Foley, Readington Township, N.J., assignor to Witco Chemical Corporation, New York, N.Y.
No Drawing. Filed Jan. 12, 1970, Ser. No. 2,357
Int. Cl. B01f *17/16, 17/22, 17/32*
U.S. Cl. 252—356 8 Claims

Emulsifier compositions comprising admixtures of (a) an imidazoline or oxazoline salt of a long chain fatty acid and (b) a salt of a long chain aliphatic amido amine and a long chain aliphatic carboxylic acid, said emulsifier compositions being particularly effective for preparing water-in-oil emulsions which exhibit excellent heat stability and metal coating properties for corrosion inhibition.

3,654,178
PARTIAL FATTY ESTERS OF GLYCEROL AND POLYGLYCEROL STABILIZED WITH ORGANIC PHOSPHITES
Otto S. Kauder, Jamaica, N.Y., assignor to Argus Chemical Corporation, Brooklyn, N.Y.
No Drawing. Filed Aug. 27, 1969, Ser. No. 853,532
Int. Cl. B01f *17/36*
U.S. Cl. 252—356 4 Claims

Compositions comprising (1) partial fatty acid esters of glycerol containing at least 40% by weight monoester of glycerol and/or partial fatty acid esters of polyglycerol wherein the polyglyceride has at least one free hydroxyl group and said esters being substantially saturated as indicated by having an iodine number less than about 15 and (2) small amounts of an organic phosphite stabilizer are resistant to deterioration at temperatures in excess of about 200° C. The compositions are widely used as surfactants and dispersing agents.

3,654,179

INDICATOR FOR DETECTING HYDROGEN PEROXIDE AND PEROXIDATIVE COMPOUNDS CONTAINING BINDSCHEDLER'S GREEN

Robert Bauer, Bristol, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

No Drawing. Filed Mar. 1, 1971, Ser. No. 119,864
Int. Cl. C12k *1/04*
U.S. Cl. 252—408 5 Claims

Bindschedler's Green has been found to be an excellent indicator for detecting hydrogen peroxide and peroxidative active compounds. For example, when said indicator is formulated with glucose oxidase and peroxidase, it provides a very sensitive test for glucose in urine and other body fluids.

3,654,180

INDICATOR FOR DETECTING HYDROGEN PEROXIDE AND PEROXIDATIVE COMPOUNDS CONTAINING ALPHA NAPHTHOFLAVONE

Robert Bauer, Bristol, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

No Drawing. Filed Mar. 1, 1971, Ser. No. 119,926
Int. Cl. C12k *1/04*
U.S. Cl. 252—408 8 Claims

Alpha naphthoflavone is an excellent indicator for detecting hydrogen peroxide and peroxidative compounds such as hemoglobin. When formulated with either a peroxidative active compound or a peroxide, this indicator provides a very sensitive chromogenic response to the presence of said constituents in aqueous fluids.

3,654,181

METHOD FOR ACTIVATION OF IRON OXIDE CONTAINING DEHYDROGENATION CATALYSTS

Samuel S. Sutherland, Jr., Freeport, and George W. Dailey, Angleton, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 21, 1970, Ser. No. 82,576
Int. Cl. B01j *11/02, 11/30*
U.S. Cl. 252—414 2 Claims

A method of activation of the self-regenerating iron oxide catalysts employed to dehydrogenate ethylbenzene to styrene by operating the reactor containing such catalyst so as to produce abnormally high conversions of ethylbenzene for a period of at least two days. Thereafter, the activity of the catalyst is improved at the usual levels of conversion.

3,654,182

REGENERATION OF A COKE-DEACTIVATED CATALYST COMPRISING A COMBINATION OF PLATINUM, GERMANIUM AND HALOGEN WITH A POROUS CARRIER MATERIAL

John C. Hayes, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed Nov. 26, 1969, Ser. No. 880,411
The portion of the term of the patent subsequent to Nov. 23, 1988, has been disclaimed
Int. Cl. B01j *11/02, 11/18, 11/80*
U.S. Cl. 252—415 15 Claims

A deactivated hydrocarbon conversion catalyst, which is a combination of a platinum group component, a germanium component and a halogen component with a porous carrier material and which has been deactivated by a deposition of carbonaceous material thereon during a previous contacting with a hydrocarbon charge stock at hydrocarbon conversion conditions, is regenerated by the sequential steps of: (1) burning carbon from the deactivated catalyst at a relatively low temperature with a substantially sulfur-free first gaseous mixture containing relatively small amounts of oxygen, H_2O and HCl; (2) treating the resulting catalyst at a relatively high temperature with a second gaseous mixture containing O_2, H_2O and HCl; (3) purging oxygen from contact with the resulting catalyst; and (4) reducing the resulting catalyst by contacting with a substantially sulfur-free third gaseous mixture containing hydrogen and small amounts of H_2O and HCl. Key features of the regeneration method involve the presence of both H_2O and HCl in the gaseous mixtures used in the carbon-burning, oxygen-treating and reduction steps, the use of sulfur-free gaseous mixtures in all of these steps, and the careful control of the mole ratio of H_2O to HCl employed in each of these gaseous mixtures.

3,654,183

CATALYST FOR POLYMERIZATION OF ETHYLENE OXIDE

Howard Paul Klein, Heinz Schulze, and George Phillip Speranza, Austin, Tex., assignors to Jefferson Chemical Company, Inc., Houston, Tex.

No Drawing. Original application Nov. 7, 1968, Ser. No. 774,202, now Patent No. 3,532,645. Divided and this application Jan. 26, 1970, Ser. No. 5,925
Int. Cl. C08g *23/06*
U.S. Cl. 252—431 11 Claims

A catalyst for use in the polymerization of ethylene oxide is prepared by contacting an alkaline earth metal hexammoniate with a cyclic imino ether in the presence of an excess of liquid ammonia at conditions such that the ammonia remains in the liquid state. This catalyst preparation may also be carried out in the presence of a normally liquid inert hydrocarbon solvent.

3,654,184

REFORMING CATALYST AND METHOD OF MANUFACTURE

Kenneth R. McCallister and Thomas P. O'Neal, Shreveport, La., assignors to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed Feb. 2, 1970, Ser. No. 7,972
Int. Cl. B01j *11/78*
U.S. Cl. 252—442 9 Claims

A catalyst composition comprising combined halogen, a platinum group metal and germanium oxide composited with alumina. The catalyst composition is characterized by a method of preparation whereby an impregnating solution is prepared by dissolving germanium dioxide in water at a temperature of at least about 160° F. and a soluble platinum group metal compound added thereto. The catalyst composition is particularly useful in the reforming of gasoline fractions to improve the anti-knock characteristics thereof.

3,654,185

ZINC-CONTAINING ZEOLITE CATALYST

Thomas E. Berry, East Alton, Ill., assignor to Shell Oil Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 803,091, Feb. 27, 1969. This application Jan. 9, 1970, Ser. No. 1,854
Int. Cl. B01j *11/40*
U.S. Cl. 252—455 Z 8 Claims

A crystalline alumino-silcate zeolite catalyst support having high crystalline stability and acidic catalytic activity is prepared from an alkali zeolite, preferably a Y-faujasite, by (1) removing the alkali metal ions to below about 1.0% w. by ion exchange, and (2) incorporating zinc ions and calcining at a high temperature of about 800° C. The support can then be combined with hydrogenative metals such as Group VIII and Group VI–B, followed by drying and calcining to provide superior hydroisomerization and hydrocracking catalysts.

3,654,186
MANUFACTURE OF DEHYDROGENATION CATALYST
Kenneth D. Vesely, Arlington Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
No Drawing. Filed Apr. 13, 1970, Ser. No. 27,989
Int. Cl. B01j *11/32*
U.S. Cl. 252—465 **5 Claims**

A method of catalyst manufacture. Alumina, an alkali metal hydroxide and a soluble compound of chromium are prepared in aqueous slurry, the alumina being a substantially pure boehmite alumina monohydrate. The slurry is aged, spray-dried and calcined to yield a microspherical product particularly useful as a dehydrogenation catalyst in a fluidized type of operation.

3,654,187
CONDUCTIVE FILM FOR ELECTRIC HEATER
Haruo Takenaka, Nobuo Hiratsuka, and Toshiaki Okiyama, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
No Drawing. Filed Jan. 30, 1969, Ser. No. 795,343
Claims priority, application Japan, Jan. 30, 1968, 43/5,561
Int. Cl. B01f *5/00;* **H01b** *1/06*
U.S. Cl. 252—511 **8 Claims**

A conductive film for electric heaters containing a plastic film having a thermal softening point of higher than 100° C. and having uniformly dispersed therein 5–50% by weight based on the plastic film of a conductive material, the thickness of the fim being less than 400 microns and the intrinsic volume resistance being less than $10^6\Omega$/cm.

3,654,188
PREPARATION OF SOLID SOLUTIONS COMPRISING A VALVE METAL DIOXIDE AND A PRECIOUS METAL DIOXIDE
James M. Kolb, Mentor, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio
No Drawing. Filed Sept. 23, 1970, Ser. No. 74,876
Int. Cl. H01b *1/08*
U.S. Cl. 252—520 **4 Claims**

A solid solution of a valve metal dioxide and a precious metal dioxide is prepared in bulk form by compacting a mixture of a valve metal with a precious metal salt followed by careful heating in an oxidizing atmosphere.

3,654,189
METHOD OF PREPARING POLYMERIC METAL PHOSPHINATES
David L. Venezky, Fairfax County, Va., assignor to the United States of America as represented by the Secretary of the Navy
No Drawing. Continuation-in-part of application Ser. No. 658,985, Aug. 4, 1967. This application Mar. 16, 1970, Ser. No. 20,095
Int. Cl. C08g *33/16, 33/20*
U.S. Cl. 260—2 P **16 Claims**

A method of preparing poly(metal phosphinates) wherein a solution of a dihydrocarbon phosphinic acid in acetic anhydride is heated under reflux with a hydrous polyvalent metal nitrate or a combination of hydrous polyvalent metal nitrates and the products thereof.

3,654,190
FIRE RETARDANT INTUMESCENT PAINT
Donald Levine, Silver Spring, Md., assignor to the United States of America as represented by the Secretary of the Navy
No Drawing. Filed May 28, 1970, Ser. No. 41,641
Int. Cl. C08c *17/10;* **C08d** *13/10*
U.S. Cl. 260—2.5 FP **4 Claims**

Fire retardant intumescent paint comprising (1) a binder such as chlorinated natural rubber, solid vinyl-toluene/butadiene resin and mixtures thereof; (2) fire retardant materials such as melamine, ammonium polyphosphate or tris (2,3-dibromopropyl) phosphate and dipentaerythritol or tripentaerythritol, (3) a source of chlorine and a material to provide slippage such as a chlorinated paraffin, (4) a solvent such as a 50—50 mixture of toluene and xylol, (5) an anti-settling agent, (6) a coloring agent such as titanium dioxide or a mixture of yellow oxide and black iron oxide; and (7) a surfactant.

3,654,191
CURABLE EPOXIDE COMPOSITIONS COMPRISING A POLYEPOXIDE, AN N-GLYCIDYL- OR N-β-METHYLGLYCIDYL-OXAZOLIDIN - 2-ONE AND AND EPOXIDE CURING AGENT
Juergen Habermeier, Allschwil, Hans Batzer, Arlesheim, Daniel Porret, Binningen, and Walter Kunz, Basel, Switzerland, assignors to Ciba Limited, Basel, Switzerland
No Drawing. Filed July 7, 1970, Ser. No. 52,985
Claims priority, application Switzerland, July 29, 1969, 11,563/69
Int. Cl. C08g *31/14*
U.S. Cl. 260—2 N **6 Claims**

Curable mixtures, which are suitable for the manufacture of shaped articles, coatings and adhesive bonds, and which comprise (a) a polyepoxide compound containing at least 2 epoxide groups, (b) an unsubstituted or substituted N-glycidyl- or N-β-methylglycidyl-oxazolidin-2-one compound, and (c) a curing agent for epoxide resins, such as a polyamine or a polycarboxylic anhydride.

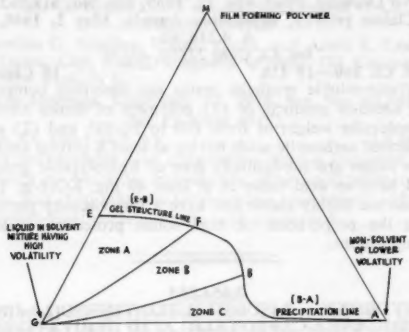
3,654,192
POLY(ARYLENE S-TRIAZINES)
Herward A. Vogel, Oakdale Township, Washington County, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
No Drawing. Filed Aug. 19, 1968, Ser. No. 753,743
Int. Cl. C08g *33/00*
U.S. Cl. 260—2 R **21 Claims**

Aromatic dinitriles, such as 4,4′-dicyanodiphenyl ether, are heated in the presence of a catalyst, such as trifluoromethane sulfonic acid or a Lewis acid catalyst, e.g., zinc chloride, to form solid polymers with a plurality of s-triazine rings linked together with arylene bridges, such polymers being useful in films, coatings, fibers, molded articles, adhesives, and sealants.

3,654,193
OPAQUE, MICROPOROUS FILM AND PROCESS FOR PREPARING THE SAME
Jerome A. Seiner, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Continuation-in-part of application Ser. No. 524,923, Feb. 1, 1966. This application Jan. 13, 1970, Ser. No. 2,536
Int. Cl. C08c *1/26*
U.S. Cl. 260—2.5 M **28 Claims**

The disclosed invention relates to opaque films with enhanced optical properties produced by the inclusion of pigments, fluorescent materials and optical brighteners in the opaque films in such a manner as to maximize their effectiveness therein. The films of this invention, absent the above described additives, are microporous and opaque in and of themselves. Therefore, lesser amounts of the additives are necessary to obtain desired optical properties. The preparation of the films of the disclosed invention involves the mixing of a film forming polymer with a solvent mixture for the film forming polymer, whereby the solvent mixture comprises at least two miscible liquids, at least one of the liquids being a nonsolvent for the polymer and having a lower volatility than that of the other liquids in the mixture. The polymer solvent mixture is then applied to a substrate and the

solvent mixture is removed as by evaporation. During the removal, a gelled film having entrapped therein the low volatility non-solvent is first formed and upon further evaporation, the non-solvent is removed, leaving behind small closed voids in its place. These voids cause the film to be opaque.



The added ingredients are included by dispersing them in the solvent mixture of the above-described process prior to the removal of the solvent mixture from the composition.

3,654,194

PROCESS FOR PRODUCING POLYOXYALKYLENE ETHER-POLYOLS FROM LIGNIN AND TANNIN AND PRODUCTS SO MADE

Daniel T. Christian, Baton Rouge, La., Melvin Look, El Cerrito, and Albert Nobell, Coloma, Calif., and Thomas S. Armstrong, Carson City, Nev., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

No Drawing. Original application Feb. 6, 1967, Ser. No. 614,043, now Patent No. 3,546,199, dated Dec. 8, 1970. Divided and this application Apr. 27, 1970, Ser. No. 32,360

Int. Cl. C08g *22/14, 22/44*

U.S. Cl. 260—2.5 **3 Claims**

A process for producing polyoxyalkylene ether-polyols from lignin or tannin by reacting lignin or tannin with an oxyalkylating agent thereby producing a polyoxyalkylene ether-polyol adapted to be reacted with isocyanates having at least 2 NCO groups per molecule to produce a urethane product.

3,654,195

PROCESS FOR THE PREPARATION OF POLYURETHANE FOAMS IN THE PRESENCE OF AN ORGANOPOLYSILOXANE COPOLYMER SURFACTANT

William J. Raleigh, Watervliet, N.Y., assignor to General Electric Company

No Drawing. Filed May 27, 1970, Ser. No. 41,067

Int. Cl. C08g *22/44*

U.S. Cl. 260—2.5 AH **2 Claims**

An organopolysiloxane copolymer of the formula,

$$R^2(C_nH_{2n}O)_xR^3(R_2)SiO[R_2SiO]_a \rightarrow [RSiO[R'(C_nH_{2n}O)_xR^2]]_bR_2SiR^3(C_nH_{2n}O)_xR^2$$

wherein R, R^2 are lower monovalent hydrocarbon radicals, R' and R^3 are lower divalent hydrocarbon radicals, *a* has a value of at least 4, *b* has a value of at least 1, *n* has a value of from 2 to 4 and *x* has a value of at least 5.

3,654,196

METHOD OF MAKING POLYAMIDE FOAMS

Raymond Frederick Moore and Eric Smith, Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Mar. 22, 1971, Ser. No. 126,902

Claims priority, application Great Britain, Apr. 17, 1970, 18,475/70

Int. Cl. C08j *1/22*

U.S. Cl. 260—2.5 N **10 Claims**

Manufacture of polyamide foam by heating a polyamide to a temperature within its working range with an oxy-acid of phosphorus, preferably orthophosphoric acid, and a metal salt of a carboxylic acid, the salt being stable at the heating temperature but the free carboxylic acid being one which decarboxylates at the heating temperature, particularly a 2 to 6 C acid with a carboxylic group activated by a keto group or a carboxylic acid or ester group. Sodium or potassium oxalate is preferred.

3,654,197

SULPHUR-CROSSLINKABLE MOLDED SUBSTANCES

Friedrich Seifert, Marl, and Josef Bittscheidt, Datteln, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

No Drawing. Filed May 25, 1970, Ser. No. 40,409

Claims priority, application Germany, July 24, 1969, P 19 37 587.2

Int. Cl. C08c *9/14;* **C08d** *9/08*

U.S. Cl. 260—4 R **3 Claims**

Molded substances having improved cold-resistance and being unreactive to stress cracking are formed from mixtures of partly crystalline, partly amorphous, polymers together with small but significant amounts of sulphur-vulcanizable unsaturated rubber and sulphur, with or without an accelerator of vulcanization.

3,654,198

NON-CRATERING FUSIBLE POLYESTER-CELLULOSE ESTER COATING COMPOSITION

James D. Hood and James G. Stranch, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed June 29, 1970, Ser. No. 50,928

Int. Cl. C08b *21/08;* **C03c** *17/28;* **C08g** *51/36*

U.S. Cl. 260—16 **22 Claims**

A polyester coating composition including a linear polyester such as poly(1,4-cyclohexanedimethylene-50 mole percent terephthalate-50 mole percent isophthalate), cellulose acetate butyrate, and optionally a plasticizer such as di-2-ethylhexyl phthalate, a stabilizer such as dilauryl 3,3'-thiodipropionate, dyes and/or pigments, a linear bisphenolic polyester. The coating can be applied to a heatable substrate in powder form and caused to fuse by application of heat in the range of 375° F. to 500° F. producing a smooth, non-cratered surface.

3,654,199

GRANULATED CORK AND CALCINED FOSSIL SILICA FILLER HOT TOP MATERIAL

Jean Bourette, 2 Impasse de la Voumonnaie, Dreux, France

No Drawing. Continuation-in-part of application Ser. No. 718,257, Apr. 2, 1968. This application Apr. 24, 1970, Ser. No. 31,729

Claims priority, application France, Apr. 21, 1967, 103,661

Int. Cl. C08b *27/04, 27/20;* **C08f** *45/04, 45/20*
C08g *51/18, 51/04*

U.S. Cl. 260—17.2 **6 Claims**

The invention relates to a hot top or sprue plate material for ingot molds. The composition comprises calcined fossil silica filler mixed with granulated cork and agglomerated by means of a synthetic thermoplastic and/or thermosetting resin.

3,654,200

DIMETHYLOLAMIDE MODIFIED BARK ALKALI PRODUCT AND METHOD OF MAKING SAME

Tsong-Han Hsu, Brewster, N.Y., assignor to U.S. Plywood-Champion Papers Inc., Hamilton, Ohio

No Drawing. Filed July 9, 1970, Ser. No. 53,650
Int. Cl. C08b *15/06;* C08g *51/18*
U.S. Cl. 260—17.2 19 Claims

A bark alkali product made from whole bark is modified with dimethylolurea to make a thermosettable resin useful as a plywood adhesive in a method wherein coniferous tree bark is comminuted, then cooked at 90–100° C. in an aqueous sodium hydroxide solution until a predetermined formaldehyde reactivity is reached thus yielding a liquid bark alkali. The liquid bark alkali, which contains the whole bark constituents without separating into selected fractions is then modified or reacted with a dimethylolamide of a dibasic acid such as dimethylolurea at 60–75° C. to produce the modified alkali bark product of the invention which is useful as a plywood adhesive, has water resistance, can be used as a direct substitute for phenol-formaldehyde up to about 65% in adhesive formulae, and can be fused or cured by exposing the product or plywood layers containing it to sufficient heat.

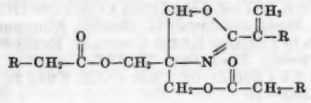
3,654,201

POLYMERIC DISPERSIONS STABILIZED BY VINYL OXAZOLINE POLYMERS

Said K. Mansour and John W. Rehfuss, Valley Station, Ky., assignors to Celanese Coatings Company, New York, N.Y.

No Drawing. Filed Jan. 19, 1970, Ser. No. 4,132
Int. Cl. C08f *45/44*
U.S. Cl. 260—23 12 Claims

Novel synthetic polymeric dispersions comprising an organic liquid medium, a dispersed polymer of ethylenically unsaturated monomers and a polymeric stabilizer of monomers of the general formula:



are prepared. In this dispersion the stabilizer is at least swollen by the organic liquid medium while the dispersed polymer is substantially insoluble in this medium. These dispersions are useful especially in their pigmented form in preparing protective coatings for various substrata.

3,654,202

POLYETHYLENE FILLED WITH TREATED CHRYSOTILE

Elio Eusebi, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

No Drawing. Original application Mar. 21, 1968, Ser. No. 714,798. Divided and this application July 27, 1970, Ser. No. 58,702
Int. Cl. C08f *19/14, 21/04*
U.S. Cl. 260—23 H 3 Claims

The reacting of chrysotile with a suitable higher unsaturated fatty acid provides an improved filler material for certain synthetic resins. In a preferred form of the invention this improved filler is prepared by reacting chrysotile fibers with the sodium salt of an unsaturated higher fatty acid in an aqueous solution thereof. The treated chrysotile may then be incorporated into a synthetic resin such as a polyethylene under conditions whereby the resin is chemically combined with the unsaturated fatty acid moiety of the filler thereby providing a filled plastic having improved tensile and flexural properties.

3,654,203

PROCESS FOR PRODUCING AND NOVEL WATER-SOLUBLE SYNTHETIC RESINS

Wolfgang Daimer and Heinrich Lackner, Graz, Austria, assignors to Vianova Kunstharz Aktiengesellschaft, Vienna, Austria

No Drawing. Filed Apr. 21, 1969, Ser. No. 818,062
Claims priority, application Austria, May 2, 1968, A 4,216/68
Int. Cl. C08f *27/00, 47/16*
U.S. Cl. 260—19 UA 18 Claims

Water-soluble synthetic resins are described comprising addition products of (1) polymers of dienes having a molecular weight of from 200 to 20,000; and (2) unsaturated carboxylic acids having at least 6 carbon atoms. The resins are substantially free of hydrolyzable groups and have an acid value of at least 40 mg. KOH/g. The resins are highly stable and have a low viscosity permitting the preparation of high solids protective coating compositions.

3,654,204

5-HYDROXY - 2-(SUBSTITUTED)THIENO[2,3-d]PYRIMIDINE-6-CARBOXYLIC ACID DERIVATIVES

Dong H. Kim, Wayne, and Arthur A. Santilli, Havertown, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Nov. 4, 1969, Ser. No. 874,033
Int. Cl. C07d *51/46*
U.S. Cl. 260—251 A 5 Claims

5-hydroxy - 2 - (substituted)thieno[2,3-d]pyrimidine-6-carboxylic acid derivatives (I) useful as CNS depressants in the calming of animals are disclosed as well as methods of synthesizing the compounds (I) by contacting a pyrimidine (IV) with a strong base. The CNS depressant compound 5-hydroxy-2-phenylthieno[2,3-d]pyrimidine-6-carboxanilide is produced by refluxing 2-phenyl-4-[(phenylcarbamoyl)methylthio] - 5 - pyrimidinecarboxylic acid, ethyl ester with sodium in 2-ethoxyethanol.

3,654,205

5-HYDROXY-2-SUBSTITUTED-FURO[2,3-d]PYRIMIDINE-6-CARBOXYLIC ACID, ESTERS

Dong H. Kim, Wayne, and Arthur A. Santilli, Havertown, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Nov. 4, 1969, Ser. No. 874,054
Int. Cl. C07d *51/46*
U.S. Cl. 260—251 A 3 Claims

5 - hydroxy - 2 - substituted-furo[2,3-d]pyridimidine-6-carboxylic acid, esters (I) useful as CNS depressants in the calming of animals are disclosed as well as methods of synthesizing the compounds (I) by contacting a pyrimidine (III) with an alkali metal hydride. The CNS depressant compound 5-hydroxy-2-phenylfuro[2,3-d]pyrimidine-6-carboxylic acid, methyl ester is produced by refluxing 4 - carboxymethoxy-2-phenyl-5-pyridinecarboxylic acid, 5-ethyl ester, 4-methyl ester with sodium hydride in tetrahydrofuran.

3,654,206

ALKOXYLATED PHOSPHATE ESTERS AS LEVELING AGENTS IN FLOOR POLISHES

Harry Kroll, Warwick, Alderic R. Therrien, Woonsocket, and Americo L. Forchielli, Cumberland, R.I., assignors to Philip A. Hunt Chemical Corporation, Palisades Park, N.J.

No Drawing. Filed Feb. 26, 1971, Ser. No. 119,341
Int. Cl. C08d *9/12;* C08c *11/70*
U.S. Cl. 260—27 11 Claims

Emulsion floor polish compositions comprising aqueous emulsions of water insoluble polymers, waxes and am-

monia soluble resins and containing the ethoxylated, propoxylated and butoxylated derivatives of mono- and diesters of ortho phosphoric acid as the leveling agent therein; said leveling agent enabling said polishes to exhibit smooth, glossy, uniform films.

3,654,207

BLOCK-RESISTANT HEAT SEALABLE WAX COMPOSITION

Karekin G. Arabian, Walnut Creek, and Arvid K. Leary, Union City, Calif., assignors to Shell Oil Company, New York, N.Y.

No Drawing. Filed July 22, 1970, Ser. No. 57,365

Int. Cl. C08f *45/52*

U.S. Cl. 260—28.5 AV **1 Claim**

A heat-sealable wax composition having improved resistance to blocking immediately after application contains wax, two ethylene-vinyl acetate copolymers and an ethylene-vinyl acetate-acrylic acid terpolymer.

3,654,208

METHOD OF REDUCING THE ANTIFREEZE CONCENTRATION IN EMULSIONS OF VINYL CHLORIDE POLYMERS

Graham John Blake, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Apr. 17, 1970, Ser. No. 29,694

Claims priority, application Great Britain, Apr. 23, 1969, 20,805/69

Int. Cl. C08f *3/30*

U.S. Cl. 260—29.6 ME **7 Claims**

A process for improving the stability of an emulsion of vinyl chloride polymer which has been prepared at a temperature below 0° C. in an aqueous medium containing sufficient antifreeze to maintain the polymerization medium liquid at the polymerization temperature which comprises reducing the concentration of the antifreeze in the emulsion preferably by subjecting the emulsion to the dialysis through a membrane permeable to antifreeze and water.

3,654,209

PROCESS FOR MANUFACTURING POLYVINYL ESTER DISPERSIONS

Eduard Bergmeister and Erwin Lieb, Burghausen, Upper Bavaria, Christian Schmidtkonz, Pocking, Niederbayern, and Hubert Wiest, Burghausen, Upper Bavaria, Germany, assignors to Wacker-Chemie G.m.b.H., Munich, Bavaria, Germany

No Drawing. Filed May 18, 1970, Ser. No. 38,587

Int. Cl. C08f *15/40*

U.S. Cl. 260—29.6 TA **5 Claims**

Process for manufacturing aqueous, highly viscous and stable polyvinyl ester dispersions with particle sizes from 0.03 to 0.2μ by radical polymerization in the aqueous phase of monomeric vinyl esters of straight-chained or branched carboxylic acids with 2 to 18 carbon atoms, at a temperature of 10 to 100° C., which comprises polymerizing 5 to 25 weight percent of the total monomer quantity in an emulsion solution up to at least 70 weight percent of the conversion of the available monomer, and then adding to said emulsifier solution the remaining monomer quantity and a mixture of 0.1 to 2 weight percent of acryl-, methacryl-, or crotonic acid and also their amides, each time referred to the total weight of the polyvinyl ester dispersion, the said addition to said emulsifier solution being added continuously in such manner that the monomer content of the reaction mixture does not exceed 25 weight percent referred to the reaction mixture.

3,654,210

AQUEOUS POLYMER DISPERSIONS ON THE BASIS OF POLYTETRA-FLUOROETHYLENE

Jurgen Kuhls and Helmut Hahn, Burghausen, Salzach, and Alfred Steininger, Thalhausen, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed July 28, 1969, Ser. No. 845,504

Claims priority, application Germany, Aug. 7, 1968, P 17 95 078.6

Int. Cl. C08f *45/24*

U.S. Cl. 260—29.6 F **12 Claims**

The present invention relates to aqueous dispersions of polymers on the basis of polytetrafluoroethylene. The polymeric particles have an average diameter of 0.2 to 0.5μ and consist of a core made from 90–99% by weight of tetrafluoroethylene and 1–10% by weight of certain halogen containing comonomers and a shell of tetrafluoroethylene homopolymer. This polymeric material has improved properties for paste extrusion processes.

3,654,211

ALKYLENE BIS-DIALKYL AROMATIC TRICARBOXYLATE PLASTICIZERS

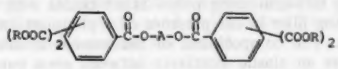
John Thomas Lutz, Jr., Cornwells Heights, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

No Drawing. Filed Apr. 7, 1970, Ser. No. 26,395

Int. Cl. C08f *45/36*

U.S. Cl. 260—31.6 **18 Claims**

Plasticizing of vinyl chloride polymers with tricarboxylic acid esters having the formula:



where R is an alkyl hydrocarbon having 4 to 13 carbon atoms, and A is the residue of an alkylene or alicyclic glycol having 2 to 10 carbon atoms or of a polyalkylene ether glycol having 4 to 8 carbon atoms. The esters are produced by the esterification of an aromatic tricarboxylic acid or acid anhydride with one of the above glycols and then with an alcohol, or with the glycol and alcohol at the same time.

3,654,212

PROCESSING AIDS FOR POLYMERS CONTAINING LACTONES

Roy F. Wright, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed Dec. 10, 1969, Ser. No. 883,987

Int. Cl. C08f *43/00, 45/44*

U.S. Cl. 260—32.6 A **10 Claims**

Polyamines and carbamic acid inner salts of polyamines provide improved processability for polymers containing lactones.

3,654,213

ALIPHATIC HYDROCARBON-COMPATIBLE PRESSURE-SENSITIVE ADHESIVE

Roger M. Christenson and Carl C. Anderson, Gibsonia, Pa., assignors to National Starch and Chemical Corporation, New York, N.Y.

No Drawing. Filed May 27, 1968, Ser. No. 732,088

Int. Cl. C08f *37/04, 45/28*

U.S. Cl. 260—33.6 UA **10 Claims**

Normally tacky pressure-sensitive adhesives based on interpolymers of vinyl esters and alkyl acrylates and which are compatible with liquid aliphatic hydrocarbon solvents such as hexane, are provided by including as at least a portion of the vinyl ester component a vinyl ester of a

tertiary alkanoic acid, the vinyl ester having 10 to 13 carbon atoms. Preferred interpolymers also contain a vinyl ester of a non-tertiary alkanoic acid and a small amount of interpolymerized ethylenically unsaturated carboxylic acid. These interpolymers can be dissolved at high solids content in organic solvents which contain a substantial proportion of liquid aliphatic hydrocarbon.

3,654,214

DISUBSTITUTED UREAS AND THOUREAS AS STABILIZERS FOR OIL-EXTENDED UNVULCANIZED BUTADIENE-STYRENE COPOLYMERS

Joseph A. Beckman, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

No Drawing. Filed Aug. 8, 1969, Ser. No. 848,733

Int. Cl. C08f *45/60*

U.S. Cl. 260—33.6 AQ **9 Claims**

An unvulcanized rubbery copolymer of butadiene and styrene, whether or not interconnected, is stabilized by a urea or thiourea in which one of the nitrogen groups is substituted by an aryl group and the other is substituted by either an aryl group or an aliphatic group.

3,654,215

FILLER CROSS-LINKED POLYSILOXANES

John C. Goossens, Scotia, N.Y., assignor to General Electric Company

No Drawing. Filed Dec. 26, 1967, Ser. No. 693,074

Int. Cl. C08g *51/04*

U.S. Cl. 260—37 SB **8 Claims**

Polysiloxane chains are cross-linked through filler particles. The cross-linked polysiloxanes are prepared by reacting SiH-containing polysiloxane chains with silanol-containing filler in the presence of a platinum-containing catalyst. The compositions of the present invention are useful as an elastic interlayer between glass panes in a safety glass laminate.

3,654,216

HIGH STRENGTH FLUOROCARBON ELASTOMER COMPOSITIONS

Kermon Murray, Enon, Ohio, assignor to the United States of America as repesented by the Secretary of the Air Force

No Drawing. Filed Feb. 25, 1970, Ser. No. 14,188

Int. Cl. C08f *15/08*

U.S. Cl. 260—41 B **6 Claims**

A high strength fluorocarbon elastomer composition is prepared by curing a mixture comprising (1) a copolymer of hexafluoropropylene and vinylidene fluoride, (2) magnesium oxide, (3) N-(4-carboxyphenyl)maleimide, and (4) benzoyl peroxide. The vulcanizates are useful in the fabrication of seals, O-rings, hose, tires, vibration damping devices, and the like.

3,654,217

POLYMERIC THERMOPLASTIC COMPOSITIONS BASED ON POST-CHLORINATED POLYVINYLCHLORIDE HAVING IMPROVED WORKABILITY AND IMPACT RESISTANCE

Egidio Cerri, Mestre, Italy, assignor to Montecatini-Edison S.p.A., Milan, Italy

No Drawing. Filed June 20, 1967, Ser. No. 647,310

Claims priority, application Italy, June 23, 1966, 14,336/66

Int. Cl. C08f *29/18, 45/04*

U.S. Cl. 260—41 **10 Claims**

A composition of matter comprising: (a) at least one member selected from the group consisting of a chlorinated polymer of vinyl chloride and a chlorinated copolymer of vinyl chloride, (b) at least one graft copolymer of a halogenated polyolefin and a member selected from the group consisting of a polymer of vinyl chloride and a copolymer of vinyl chloride, and (c) at least one mineral filler.

3,654,218

PROCESS OF FORMING AN ELASTOMER-CARBON BLACK MIXTURE

Willi Clas, Wesseling, and Wolfgang Buchel, Wesseling-Berzdorf, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

No Drawing. Filed Aug. 22, 1969, Ser. No. 852,475

Claims priority, application Germany, Aug. 24, 1968, P 17 95 222.6

Int. Cl. C08c *11/00, 11/18*

U.S. Cl. 260—41.5 **6 Claims**

A rubber latex is coagulated in the presence of an aqueous dispersion of finely divided carbon black, the dispersion being formed at a pH of 1 to 2. The coagulate may then be subjected to washing, filtering and drying and the thus-formed granulate may subsequently be subjected to a grinding step. The granulate has substantially no tendency to cake without the necessity of adding additional separating agents.

3,654,219

NOVEL FIBER GLASS-REINFORCED RESIN COMPOSITIONS AND PROCESSES FOR THEIR PREPARATION

William M. Boyer, 514 S. Roosevelt Drive 47714, and Kiyoshi Hattori, 1110 Harrelton Court 47715, both of Evansville, Ind.

No Drawing. Filed June 19, 1968, Ser. No. 738,112

Int. Cl. C08f *45/10*

U.S. Cl. 260—41.5 **5 Claims**

Novel fiber glass reinforced resin compositions which comprise blends of glass fiber reinforced resin concentrates with unreinforced resins and processes therefor, particularly a process of blending glass fiber reinforced thermoplastic resin concentrates with thermoplastic resins, the glass-fiber containing resin being dissimilar from the unreinforced blending resin, said dissimular resin comprising from 5 to about 30 percent by weight of the composition.

3,654,220

STABILIZED POLYOLEFIN COMPOSITIONS

Henryk A. Cyba, Evanston, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Continuation-in-part of application Ser. No. 750,483, Aug. 6, 1968. This application May 1, 1970, Ser. No. 33,992

Int. Cl. C08f *45/60*

U.S. Cl. 260—45.9 R **8 Claims**

Polymeric composition containing an N,N-di-(hydrocarbyloxyalkyl)-hydrocarbylamine. In one embodiment the compound serves as a curing catalyst for curable polymeric compositions. In another embodiment the compound serves as a stabilizer to retard deterioration due to oxidation, UV absorption or thermal effects.

3,654,221

PROCESS FOR PRODUCING COLOR STABLE AND ODOR-FREE HETEROCYCLIC NITROGEN COMPOUND CONTAINING POLYMERS

Albert H. Greer, Haddonfield, N.J., assignor to Sybron Corporation, Rochester, N.Y.

No Drawing. Filed Dec. 30, 1968, Ser. No. 788,059

Int. Cl. C08f *7/12, 45/60*

U.S. Cl. 260—45.9 R **9 Claims**

A color stable, odor-free polymer is produced from monomers including polymerizable heterocyclic nitrogen compounds by reacting an aqueous dispersion of

monomers in the presence of an organic, non-aromatic, water soluble additive containing at least one unsubstituted hydrazino or hydroxylamino radical in the free base form, having at least one amino group thereof unsubstituted.

3,654,222

NOVEL ORGANOTIN STABILIZER COMPOSITIONS AND RESIN COMPOSITIONS STABILIZED THEREWITH

Christian H. Stapfer, Newtown, Pa., and Ashok C. Shah, Flemington, N.J., assignors to Cincinnati Milacron Chemicals Inc., Reading, Ohio

No Drawing. Filed Nov. 21, 1969, Ser. No. 878,950

Int. Cl. C08g *45/62*

U.S. Cl. 260—45.75 K **17 Claims**

Halogen-containing polymers such as polyvinyl chloride are stabilized against degradation caused by heat, oxidation and light by (means of) a combination of an alkyltin carboxylate and a monoalkyltin sulfide. Optionally, an alkyl substituted phenol may be included.

3,654,223

POLYMERIZATION OF POLYAMIDES IN THE PRESENCE OF AQUEOUS DISPERSIONS OF PHENOLIC ANTIOXIDANTS

Douglas Hogg Thomson, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

No Drawing. Filed June 6, 1969, Ser. No. 831,233

Claims priority, application Great Britain, June 18, 1968, 29,019/68

Int. Cl. C08g *20/08, 51/58*

U.S. Cl. 260—45.95 **6 Claims**

Phenols which are substantially insoluble in water, especially sterically-hindered and polynuclear phenols with antioxidant properties, are brought into stable aqueous dispersion by agitating with water and a surface active compound containing a quaternary ammonium group. Addition of the dispersions to polymer-forming ingredients followed by polymerisation, especially in the case of polyamides, is a useful method of incorporating the phenols in polymers.

3,654,224

HYDROXYL OR THIOL TERMINATED TELOMERIC ETHERS

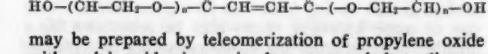
Jack Milgrom, Concord, Mass., assignor to the General Tire & Rubber Company

No Drawing. Filed Oct. 20, 1967, Ser. No. 676,712

Int. Cl. C07c *69/60, 69/80*

U.S. Cl. 260—475 P **15 Claims**

Hydroxyl or thiol terminated alkylene ether telomers varying from liquids to thermoplastic solids and composed of one or more telomer moieties from a cyclic ether taxogen joined through a carbon atom to a telogen moiety are prepared by telomerization of a cyclic ether monomer with a telogen in the presence of a catalyst of the double metal cyanide complex class. As a specific example, a hydroxyl terminated diester of the formula:



may be prepared by teleomerization of propylene oxide with maleic acid using a zinc hexacyanocobaltate dioxane complex as the telomerization catalyst.

3,654,225

PROCESS FOR THE PREPARATION OF POLYETHYLENE 1,2 - DIPHENOXYETHANE-4,4'-DICARBOXYLATE USING A MANGANESE COMPOUND AS AN ESTER INTERCHANGE CATALYST AND AMORPHOUS GERMANIUM DIOXIDE AS A CONDENSATION CATALYST

Hidehiko Kobayashi and Kiichiro Sasaguri, Tokyo, Hiroshi Komoto, Saitama, and Sukeo Kawashima, Tokyo, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Kita-ku, Osaka, Japan

No Drawing. Filed May 26, 1969, Ser. No. 827,990

Claims priority, application Japan, June 1, 1968, 43/37,135

Int. Cl. C08g *17/013, 17/015*

U.S. Cl. 260—47 C **4 Claims**

This invention discloses a process for the preparation of polyethylene 1,2 - diphenoxyethane - 4,4' - dicarboxylate which comprises reacting 1,2 - bis(p - carbomethoxyphenoxy) ethane with ethylene glycol in the presence of a manganese compound to effect an ester interchange reaction, said 1,2 - bis(p - carbomethoxyphenoxy) ethane being purified to have an acid value of 0.03 or less, subsequently adding a phosphorus compound to the reaction system to extinguish the polymerization catalytic activity of said manganese compound while controlling the concentration of ethylene glycol in the reaction system to 40% by weight or less, and thereafter effecting a polycondensation reaction in the presence of amorphous germanium dioxide. In accordance with the present invention, there can be obtained polyethylene; 1, 2-diphenoxyethane - 4,4' - dicarboxylate which is excellent in whiteness, transparency and thermal stability and low in crystallization velocity, and which is free from coloration when molded or spun and heated.

3,654,226

SOLUBLE IMIDE-QUINOXALINE COPOLYMERS

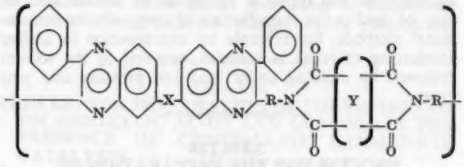
Joseph M. Augl, Sterling, Va., and James V. Duffy, Beltsville, Md., assignors to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Mar. 26, 1971, Ser. No. 128,524

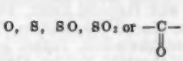
Int. Cl. C08g *33/02*

U.S. Cl. 260—50 **10 Claims**

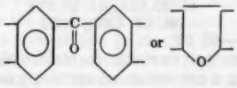
Phenylated imide quinoxaline co-polymers consisting essentially of units of the formula



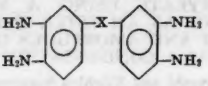
wherein X is a direct bond,



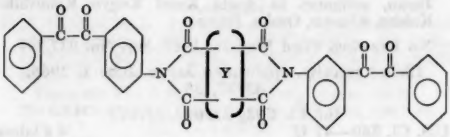
R is m or p-phenylene and Y is



which are useful as coatings for fibers, graphite precursors, films and laminating materials are prepared by contacting



with



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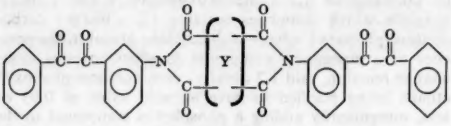


3,654,227

MANUFACTURE OF AROMATIC POLYIMIDES AND PROCESS FOR PREPARATION OF REINFORCED POLYMER ARTICLE FROM SAID POLYIMIDES

Raymond Anthony Dine-Hart, Farnborough, England, assignor to National Research Development Corporation, London, England

No Drawing. Filed Apr. 12, 1968, Ser. No. 721,093
Claims priority, application Great Britain, Apr. 13, 1967, 17,116/67; Dec. 1, 1967, 54,823/67
Int. Cl. C08g *20/32*
U.S. Cl. 260—37 N **17 Claims**

A process for the manufacture of aromatic polyimides is provided and comprises fusing an aromatic tetracarboxylic acid dianhydride, or derivative thereof, with a diorganocarbonyl derivative of an aromatic diamine whereby carboxylic acids or related simple organic compounds are eliminated and aromatic polyimides are obtained without the necessity of passing through the polyamic acid stage.

Preferably the dianhydride is fused with the diacetyl derivative of the relevant diamine and by control of the reaction conditions and product of the process may be either a generally insoluble and infusible polyimide or a soluble, fusible polymer which may be molded to produce an insoluble and infusible polyimide by further heat or may be used in the manufacture of composite by conventional methods; for example by impregnation in a fiber reinforcing material in solution, removal of the solvent followed by molding under heat and pressure and post cure.

3,654,228

PROCESS FOR THE PREPARATION OF POLYOXYMETHYLENE

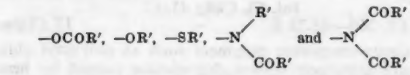
Shin'ichi Ishida, Tokyo, Noboru Ohshima, Saitama-ken, Norimasa Fujita and Kyoichiro Mori, Kanagawa-ken, Kunio Kurita and Hayashi Ohki, Tokyo, Kunio Sato, Kanagawa-ken, Kazuo Nagamatsu, Tokyo, and Akira Tokushige, Kanagawa-ken, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sept. 10, 1969, Ser. No. 856,741
Claims priority, application Japan, Sept. 11, 1968, 43/65,106, 43/65,107
Int. Cl. C08g *1/02*
U.S. Cl. 260—67 FP **9 Claims**

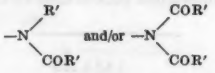
Process for polymerizing formaldehyde which comprises blowing a gas stream comprising gaseous formaldehyde into a liquid polymerization medium below the liquid level thereof in such a depth that no unreacted gas appears above the liquid level, said polymerization medium containing a catalyst selected from the group consisting of (1) tetravalent organotin compounds of the general formula,

$$R_mSnF_{4-m}$$

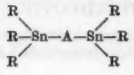
wherein *m* is an integer of from 1 to 3, R which may be the same or different represents alkyl, alkenyl, aryl and aralkyl groups having from 1 to 20 carbon atoms, whose one or more hydrogen atoms may be substituted by a member selected from the group consisting of hydroxy, carbonyl, ester, nitro, cyano, ether groups and halogen, and Y which may be the same or different represents groups of the general formulae,



wherein R′ has the same meaning as R defined above, however, when Y is the group

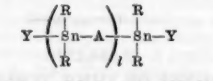


m is not 1, (2) tetravalent organotin compounds of the general formula,

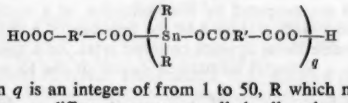


wherein R which may be the same or different represents alkyl, alkenyl, aryl and aralkyl groups having from 1 to 20 carbon atoms, whose one or more hydrogen atoms may be substituted by a member selected from the group consisting of hydroxy, carbonyl, ester, nitro, cyano and ether groups and halogen, and A represents a member selected from the group consisting of oxygen, sulfur atom and a group of the formula,

wherein R′ has the same meaning as R defined above, (3) tetravalent organotin compounds of the general formula,

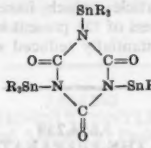


wherein *l* is an integer of from 1 to 100, R which may be the same or different represents alkyl, alkenyl, aryl and aralkyl groups having from 1 to 20 carbon atoms, whose one or more hydrogen atoms may be substituted by a member selected from the group consisting of hydroxy, carbonyl, ester, nitro, cyano and ether groups and halogen, and A represents a member selected from the group consisting of oxygen, sulfur atom and groups of the formulae, —OCOR′, —OR′, and SR′ wherein R′ has the same meaning as R defined above, (4) tetravalent organotin compounds of the formula,



wherein *q* is an integer of from 1 to 50, R which may be the same or different represents alkyl, alkenyl, aryl and aralkyl groups having from 1 to 20 carbon atoms, whose one or more hydrogen atoms may be substituted by a member selected from the group consisting of hydroxy, carbonyl, ester, ether, nitro and cyano groups and halogen, and R′ represents alkylene, alkenylene and arylene

groups having from 1 to 15 carbon atoms, and (5) tetravalent organotin compounds of the formula,



wherein R which may be the same or different represents alkyl, aryl, alkenyl and aralkyl groups having from 1 to 20 carbon atoms, whose one or more hydrogen atoms may be substituted by a member selected from the group consisting of hydroxy, carbonyl, nitro, cyano and ether groups and halogen.

3,654,229

BAKING ENAMEL VEHICLE COMPRISING THE REACTION PRODUCT OF AN OXAZOLINE WITH MELAMINE AND FORMALDEHYDE

Jerry Hoyt Hunsucker, Terre Haute, Ind., assignor to Commercial Solvents Corporation, New York, N.Y.

No Drawing. Filed May 12, 1970, Ser. No. 36,680
Int. Cl. C08g *9/24, 9/30*
U.S. Cl. 260—67.6 R **23 Claims**

An improved vehicle for the formulation of baking enamels obtained by reacting an oxazoline with a member selected from the group consisting of formaldehyde, melamine, hexamethoxymethylmelamine, urea, urea-formaldehyde resin, dimethylolpropionic acid, and phenol or mixtures thereof.

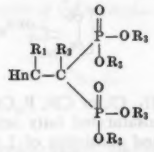
3,654,230

POLYMERIC COMPOSITIONS

Al F. Kerst, Littleton, Colo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Apr. 13, 1970, Ser. No. 28,031
Int. Cl. C08f *45/54;* **C08g** *22/16, 51/54*
U.S. Cl. 260—75 NR **14 Claims**

A polymer comprising a reactive hydrogen containing material such as polyurethane, copolymerized with an ethane diphosphonate having the formula



wherein R_1 and R_2 are hereinafter defined, R_3 is hydrogen or an organic radical, and n is an integer having a value of 1 or 2.

3,654,231

MANUFACTURE OF EXTRUDED SUPER-POLYESTER PRODUCTS

Carl T. Brozek, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed June 29, 1970, Ser. No. 50,768
Int. Cl. C08g *17/003*
U.S. Cl. 260—75 M **6 Claims**

In a process for polymerizing and extruding polyester film or other products comprising the steps of:

(a) in a prepolymer build-up step performed in a separate apparatus, polymerizing prepolymer to a polymer having a product inherent viscosity above about 0.7; and

(b) extruding the polymer to finished form;

the present invention provides the improvement which comprises eliminating the separate, polymer build-up step in a separate apparatus by (1) introducing a polyfunctional polyol cross-linking agent into the prepolymer, and (2) providing a mechanical energy input of from about 15 to about 150 ft./lbs./sec. per pound of the polyester material in the mixing stage of the extrusion apparatus thereby permitting polymer formation and attainment of product inherent viscosity in a single and continuous extrusion step with very little, if any, adverse affect on the tensile or other physical properties of the extruded material. Otherwise, conventional extrusion conditions including time and temperature are used to accomplish polymerization and extrusion in a single continuous operation without the need for a separate and distinct polymer build-up step for purposes of attaining product inherent viscosity prior to extrusion.

3,654,232

SURFACE BROMINATED FIBERS COMPRISED OF POLY(1,4 - CYCLOHEXYLENE-DIMETHYLENE TEREPHTHALATE)

Winston J. Jackson, Jr., and John R. Caldwell, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Feb. 5, 1971, Ser. No. 113,029
Int. Cl. C08g *53/20*
U.S. Cl. 260—75 T **4 Claims**

Fibers comprised of poly(1,4-cyclohexylenedimethylene terephthalate) having improved resistance to burning are prepared by contacting the fiber with a brominating agent in the presence of a chlorinating agent, and the sum of bromine and chlorine on the surface of the fiber is at least four percent of the weight of the fiber and the toughness of the fiber is reduced not more than 20 percent, based on the toughness of the fiber before contacting the fiber.

3,654,233

PROCESS FOR THE MANUFACTURE OF LINEAR POLYESTERS USING METAL GERMANATES AND METAL GLYCOL GERMANATES AS THE CATALYST

Christian Kosel, Bobingen, and Adolf Hartmann, Gesserts-hausen, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Apr. 29, 1968, Ser. No. 725,153
Claims priority, application Germany, May 5, 1967, F 52,329
Int. Cl. C08g *17/13*
U.S. Cl. 260—75 R **4 Claims**

Manufacturer of linear polyesters by an ester-interchange between dicarboxylic acid esters of low molecular weight aliphatic alcohols and diols and subsequent polycondensation of the bis-diol esters in the presence of metal germanates and metal glycol germanates as compounds catalyzing both the ester-interchange and the polycondensation.

3,654,234

PROCESS FOR PREPARATION OF POLYESTERS OF DICARBOXYLIC ACIDS AND GLYCOLS IN THE PRESENCE OF CRYSTALLINE GERMANATE CATALYSTS

Lambert Gaston Jeurissen, Edegem, Belgium, assignor to Gevaert-Agfa N.V., Mortsel, Belgium

No Drawing. Filed July 1, 1969, Ser. No. 838,347
Claims priority, application Great Britain, Nov. 29, 1968, 56,896/68
Int. Cl. C08g *17/15*
U.S. Cl. 260—75 R **9 Claims**

An improved catalyst for the polycondensation of a glycol dicarboxylate and the process for the preparation of film-forming polyesters by the polycondensation of a dicarboxylate in the presence of said catalyst are described. The catalyst is a trihydrogen germanate (IV) of an alkali metal, an alkaline earth metal, or an ammonium group. The film-forming polyester made by the process utilizing

said catalyst has improved physical properties including color and stability.

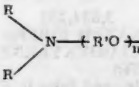
3,654,235

ANTISTATIC POLYCARBONAMIDE FILAMENTS

Lawrence W. Crovatt, Jr., Gulf Breeze, and Dennis J. Durant, Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed May 11, 1970, Ser. No. 36,451
Int. Cl. C08g 20/38
U.S. Cl. 260—78 S 11 Claims

Synthetic melt-spun polyamide filaments are provided having uniformly admixed therein, as a separate phase, from about 1% to about 15% by weight of the polyamide of an amine of the structure



wherein each R is an alkyl group, R′ is an alkylene group and *n* is an integer of at least 15. Yarns, fibers and fabrics made from these filaments possess permanent antistatic properties, even after numerous launderings.

3,654,236

TERPOLYAMIDES

James S. Ridgway, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of application Ser. No. 758,687, Sept. 10, 1968. This application Sept. 15, 1970, Ser. No. 72,529
Int. Cl. C08g 20/20
U.S. Cl. 260—78 R 10 Claims

High shrinkage polymers useful in production of hosiery and crimpy conjugate yarns are provided by linear terpolyamides of at least one aliphatic diamine such as hexamethylene diamine, at least one aliphatic dicarboxylic acid such as adipic acid, at least one benzene dicarboxylic acid such as terephthalic acid and at least one diphenyl-substituted aliphatic dicarboxylic acid such as α,α′-diphenyladipic acid.

3,654,237

ALIPHATIC ACID SULFONATE MODIFIED POLYAMIDES

Christian Kosel, Bobingen, Adolf Hartmann, Gessertshausen, and Gerhard Gatys, Bobingen, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed July 7, 1969, Ser. No. 839,661
Claims priority, application Germany, July 11, 1968, P 17 70 863.3
Int. Cl. C08g 20/38
U.S. Cl. 260—78 R 4 Claims

Usual polyamide-forming starting substances are condensed in the presence of aliphatic sulfonates or sulfonate esters to obtain polyamides having a particularly good dye affinity.

3,654,238

PROCESS FOR THE PREPARATION OF POLYAMIDE-SULPHOXIDE

Sebastiaan E. M. Kooijman, Geleen, and Jozef A. Thoma, Sittard, Netherlands, assignors to Stamicarbon N.V., Heerlen, Netherlands

No Drawing. Continuation-in-part of application Ser. No. 647,906, June 22, 1967. This application July 14, 1969, Ser. No. 841,598
Claims priority, application Netherlands, July 12, 1968, 6809969
Int. Cl. C08g 20/38
U.S. Cl. 260—78 A 6 Claims

Polyamide sulphoxides are prepared by oxidizing polyamides composed of monomer units having the formula [—NH—CO—$(CH_2)_2$—S—$(CH_2)_3$—] with an aqueous solution of hydrogen peroxide at about room temperature. Polyamide articles which have been treated according to the process of the present invention have been found to have substantially reduced surface charge.

3,654,239

PROCESS FOR THE PREPARATION OF POLY-(α-CYANOACRYLATES)

John M. McIntire and Thomas H. Wicker, Jr., Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 729,905, May 17, 1968. This application Nov. 20, 1970, Ser. No. 91,539
Int. Cl. C08f 1/11, 3/74
U.S. Cl. 260—78.4 N 10 Claims

Process for preparing a poly(α-cyanoacrylate) comprising polymerizing a monomer employing a free radical or anionic catalyst and using a solvent having a solubility parameter of about 6.9 to about 9.0 and dielectric constant of less than about 10, whereby the polymer separates from the solvent during polymerization. These poly(α-cyanoacrylates) are useful as viscosity modifiers in α-cyanoacrylate adhesive compositions.

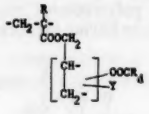
3,654,240

CROSSLINKING POLYMERS

Gaetano F. D'Alelio, 2011 E. Cedar St., South Bend, Ind. 46617

No Drawing. Continuation-in-part of application Ser. No. 581,688, Sept. 26, 1966. This application Nov. 25, 1968, Ser. No. 778,849
Int. Cl. C08f 3/64, 15/16
U.S. Cl. 260—78.5 18 Claims

This invention relates to crosslinkable polymers having a plurality of repeating units of the formula,



wherein R is H, CH_3, Cl, or CN, R_dCOO— is the radical derived from an unsaturated fatty acid containing 16 to 20 carbon atoms and consisting of 1 to 4 —CH=CH— groups, and Y represents —OH, an acyloxy (—OOCR′), or a urethane group (—OOCNHR″), wherein R′ is hydrogen or an aliphatic, aromatic or cycloaliphatic hydrocarbon radical preferably of no more than 20 carbon atoms, and R″ is R′ or a monoisocyanate derivative of an R′ hydrocarbon radical. These new polymers become insoluble on exposure to air.

3,654,241

FAST CURING ONE-PART SEALANT

John I. Doughty, White Bear Lake, and Philip G. Christman, St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Continuation-in-part of application Ser. No. 668,183, Sept. 15, 1967. This application Oct. 30, 1969, Ser. No. 872,746
Int. Cl. C08g 23/00
U.S. Cl. 260—79 15 Claims

A one-part, can-stable, mercapto-terminated polymer-based sealant containing ingredients capable of reacting to liberate water in situ thereby enhancing the cure rate of

the sealant even at low humidities. The ingredients include (1) a latent oxidative curing agent, (2) a latent, hygroscopic accelerating agent, and (3) a sulfonamido containing compound.

3,654,242
POLY(p-STYRENESULFONYLHYDRAZIDES)
John E. Herweh and Algirdas C. Poshkus, Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.
No Drawing. Filed July 30, 1968, Ser. No. 748,658
Int. Cl. C08f *27/08, 27/06*
U.S. Cl. 260—79.3 R **2 Claims**

A novel class of polymeric compositions having repeating structural units of the formula

These compositions find utility as polymeric blowing agents for use in forming foamed resinous compositions.

3,654,243
VULCANIZATION OF UNSATURATED ETHYLENE-α-OLEFIN RUBBERS
Harald Blümel, Marl, Germany, assignor to Chemische Werke Huls A.G., Marl, Germany
No Drawing. Filed Oct. 13, 1965, Ser. No. 495,695
Claims priority, application Germany, Oct. 16, 1964, C 34,115
Int. Cl. C08f *27/06*
U.S. Cl. 260—79.5 B **21 Claims**

Vulcanized unsaturated ethylene-propylene rubbers having improved resistances to tear and crack growth are produced by the use of a vulcanization system comprising thiuram accelerators and/or dithiocarbamate accelerators, together with an amine of the formula:

wherein

R_1 is an alkyl, hydroxyalkyl, alkyloxyalkyl, or alkenyloxyalkyl residue;

R_2 is H, or a cycloalkyl residue; and

R_3 is H, or an alkyl, hydroxyalkyl, alkyloxyalkyl, or alkenyloxyalkyl residue.

This system also results in a substantially increased vulcanization velocity, as compared to prior art systems.

3,654,244
POLYMERS FOR SOIL-RELEASE TEXTILE FINISHES
Allen G. Pittman, El Cerrito, and William L. Wasley, Berkeley, Calif., assignors to the United States of America as represented by the Secretary of Agriculture
No Drawing. Filed Mar. 16, 1970, Ser. No. 20,096
Int. Cl. C08f *15/16, 15/40*
U.S. Cl. 260—79.7 **27 Claims**

Fluorocarbon acrylates or methacrylates are copolymerized with acrylates or methacrylates which contain one or more alkyleneoxy groups. The copolymers are useful for application to fibrous materials to provide both soil repellency and soil releasability.

3,654,245
FLUORINE-CONTAINING POLYMERS
Yutaka Kometani, Sanda-shi, and Masayoshi Tatemoto, Takatsuki-shi, Japan, assignors to Daikin Kogyo Kabushiki Kaisha, Osaka-shi, Japan
No Drawing. Continuation of application Ser. No. 477,012, Aug. 3, 1965. This application Nov. 25, 1968, Ser. No. 778,856
Claims priority, application Japan, Aug. 7, 1964, 39/45,124
Int. Cl. C08f *3/42, 3/62, 3/74*
U.S. Cl. 260—80 **17 Claims**

Polymers made from unsaturated aliphatic polyfluorocarboxylic acids having a double bond at an ω position and 4–19 carbon atoms, and derivatives of such acids.

3,654,246
VULCANIZABLE, AMORPHOUS OLEFINIC TERPOLYMERS OF ALPHA OLEFINS AND POLYENES PRESENTING AN ALKYLIDENIC GROUP CONJUGATED WITH A DOUBLE BOND OF A RING WHICH IS A MEMBER OF AN ENDOCYCLIC GROUP
Walter Marconi, Sebastiano Cesca, and Arnaldo Roggero, S. Donato Milanese, Italy, assignors to Snam Progetti S.p.A., Milan, Italy
No Drawing. Filed Aug. 6, 1968, Ser. No. 750,478
Claims priority, application Italy, Aug. 8, 1967, 19,319/67
Int. Cl. C08f *17/00*
U.S. Cl. 260—80.7 **15 Claims**

Novel vulcanizable amorphous terpolymers are disclosed which comprise two alpha-olefins and a polyene containing an alkylidene group conjugated with a double bond of a ring which is a member of an endocyclic system. The process for preparing these terpolymers is also disclosed.

3,654,247
PRODUCTION OF 93–100% ALCOHOLYZED POLYVINYL ALCOHOL HAVING LOW COLD WATER SOLUBLES CONTENT AND IMPROVED SLURRYING PROPERTIES
John E. Bristol, Niagara Falls, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Continuation-in-part of application Ser. No. 707,406, Feb. 23, 1968. This application Feb. 17, 1970, Ser. No. 12,123
Int. Cl. C08f *3/34*
U.S. Cl. 260—86.1 E **13 Claims**

The cold water solubles content and/or the cold water imbibing tendency of a 93 to 100% alcoholyzed polyvinyl alcohol are reduced by heating at a temperature of 70 to 190° C., preferably 90 to 150° C., a dispersion of the polyvinyl alcohol in a liquid solvent comprising 30 to 100% methanol, 0 to 13% water and 0 to 45% of a 2–5 carbon monohydric alcohol, methyl acetate, acetone, ethylene glycol dimethyl ether, toluene, methylene chloride, or the like. Such heat treatment improves the cold water slurrying properties of the polyvinyl alcohol and increases the room temperature water resistance of coatings and films prepared from the polyvinyl alcohol.

3,654,248
PROCESS FOR THE PREPARATION OF VINYL CHLORIDE POLYMERS FOR PASTE
Eiichi Iida, Tokyo, Tsuneo Komatsubara, Sadao Ueno, and Soichiro Takeuchi, Takaoka-shi, Etuo Matui, Tokyo, and Toshio Sano, Kawasaki-shi, Japan, assignors to The Japanese Geon Company, Ltd., Tokyo, Japan
No Drawing. Filed July 27, 1970, Ser. No. 58,664
Claims priority, application Japan, July 31, 1969, 44/60,283
Int. Cl. C08f *1/13, 3/30*
U.S. Cl. 260—87.5 **17 Claims**

A process for the preparation of a vinyl chloride polymer for paste resin, which comprises dispersing in water

a vinyl chloride monomer alone or a mixture of vinyl chloride with other monomer or monomers which are copolymerizable therewith, together with at least one oil-soluble catalyst selected from the group consisting of diacyl peroxides, azo compounds, peroxy esters of organic acids and acetylcyclohexylsulfonyl peroxide, and an anionic surfactant of alkylarylsulfonate type, subjecting the resulting dispersion to a homogenization treatment, and thereafter polymerizing the same, acid polymerization being carried out in the presence of at least one halogenated hydro-carbon having not less than 8 carbon atoms and a halogen content of 20–70% by weight.

3,654,249
PROCESS FOR POLYMERIZING α-OLEFINS
Bernd Diedrich, Frankfurt am Main, and Wilhelm Dummer, Wiesbaden, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany
No Drawing. Filed June 25, 1969, Ser. No. 836,585
Claims priority, application Germany, Mar. 13, 1969, P 19 12 706.1
Int. Cl. C08f *1/56, 3/06*
U.S. Cl. 260—88.2 **8 Claims**

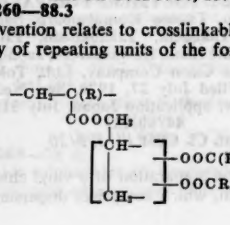
The invention provides a process for homopolymerizing or copolymerizing ethylene in the presence of mixed catalysts comprising as component A the reaction product of 0.1 to 1.0 part by weight of $Mg(OH)_2$, 1 part by weight of $Ti(O—isoC_3H_7)_4$ and 0.4 to 0.9 part by weight of $TiCl_4$ and as component B an organo-aluminum compound. Under a pressure of up to 20 atmospheres the polymer yields are so high per unit of catalyst that the residues thereof need not be removed. By variation of the proportions of $Mg(OH)_2$ to titanium compounds polymers having densities in the industrially interesting range of from 0.952 to 0.962 g./cc. can be obtained.

3,654,250
COPOLYMERS FROM PARA TERTIARY BUTYL STYRENE AND ALPHA METHYL STYRENE AND METHOD FOR PRODUCING SAME
Bernard J. Davis, Pass Christian, Miss., assignor to Reichhold Chemicals, Inc., White Plains, N.Y.
No Drawing. Filed Nov. 17, 1969, Ser. No. 877,516
Int. Cl. C08f *15/04*
U.S. Cl. 260—88.2 C **9 Claims**

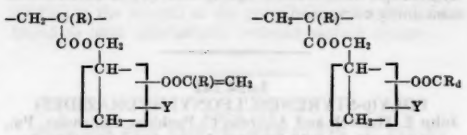
Resinous copolymers of para tertiary butyl styrene and alpha methyl styrene are prepared by reacting (A) para tertiary butyl styrene and (B) alpha methyl styrene in the presence of a Friedel-Crafts catalyst at a temperature ranging from about 5° C. to about 55° C. and recovering these resinous copolymers. These resinous copolymers are colorless, and have softening points up to about 140° C. and are soluble down to about 0° C. in odorless low-kauri butanol (KB) value solvents.

3,654,251
CROSSLINKING POLYMERS
Gaetano F. D'Alelio, 2011 E. Cedar St., South Bend, Ind. 46617
No Drawing. Filed Nov. 25, 1968, Ser. No. 778,850
Int. Cl. C08f *3/64, 15/26*
U.S. Cl. 260—88.3 **18 Claims**

This invention relates to crosslinkable polymers having a plurality of repeating units of the formula



or a mixture of repeating units of the formulas



In which R represents H and CH_3, R_d represents an unsaturated hydrocarbon group containing 15 to 20 carbon atoms and consisting of a terminal CH_3 group and at least one and no more than four —CH=CH— groups and the remainder —CH_2— groups, and Y represents —OH or R'COO— wherein R' is a monovalent hydrocarbon containing one to 20 carbon atoms. These polymers are multipurpose polymers and are converted to crosslinked polymers by air drying or by radical and thermal initiation, and by ultraviolet and ionizing radiation.

3,654,252
ALKALI RESISTANT POLYMERS AND METHOD THEREFOR
Charles F. Capizzi, 4904 Harmon Ave., Las Vegas, Nev. 89109
No Drawing. Filed Jan. 29, 1970, Ser. No. 6,960
Int. Cl. C08f *3/30, 27/00*
U.S. Cl. 260—92.8 A **4 Claims**

The reaction products of vinyl chloride polymers (e.g. polyvinyl chloride) and trichloroethylene which are useful as coatings to protect surfaces from the action of acids and bases. Said products are formed by dissolving polyvinyl chloride in a ketone solvent. The polyvinyl chloride is then reacted with trichloroethylene by application of heat in the absence of air or by evaporating the solvent by heating same or by allowing the reaction mixture to stand at room temperature.

3,654,253
CONTINUOUS PRODUCTION OF ETHYLENE HOMOPOLYMERS
Klaus Steigerwald, 29 Ottweilerstrasse; and Oskar Buechner, 23 an der Froschlache, both of 6700 Ludwigshafen, Germany; Wolfgang Ball, O 6, 9, 6800 Mannheim, Germany; and Helmut Pfannmueller, 9 Donnersbergstrasse; and Friedrich Urban, 29 Schillerstrasse, both of 6703 Limburgerhof, Germany
No Drawing. Filed Oct. 31, 1969, Ser. No. 873,136
Claims priority, application Germany, Nov. 7, 1968, P 18 07 493.6
Int. Cl. C08f *3/04, 1/60, 1/80*
U.S. Cl. 260—94.9 R **7 Claims**

Production of ethylene homopolymers at elevated temperature under superatmospheric pressure in a tube reactor having two successive reaction zones, a mixture of ethylene, polymerization initiator and polymerization modifier being introduced continuously at the beginning of each reaction zone. At the beginning of the first reaction zone a mixture of ethylene, an organic hydroperoxide having a half value temperature in the range from 200° to 260° C. and a polymerization modifier having a C_s value of from 2.0×10^{-2} to 1.0×10^{-4} is introduced and at the beginning of the second reaction zone a mixture of an organic peroxide having a half value temperature in the range from 150° to 195° C. and a polymerization modifier having a C_s value of from 2.0×10^{-2} to 1.0×10^{-4} is introduced. The half value temperatures of the two organic peroxides are at least 20° C. apart. The products have a wide molecular weight distribution and are practically devoid of very high molecular weight constituents.

3,654,254

POLYMERISATION PROCESS

Brian Ernest Job, Alexander Joseph Peter Pioli, and Till Medinger, Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Nov. 25, 1969, Ser. No. 879,905

Claims priority, application Great Britain, Dec. 16, 1968, 59,704/68

Int. Cl. C08f *3/04, 1/30*

U.S. Cl. 260—94.9 B **6 Claims**

Ethylene is polymerised by contact with an initiator of the general formula $M(all)_3X$ or $M(all)_2X_2$ where M is a transition metal of Group IV of the Periodic Table of Elements, (all) is a π-allylic group and X is a halogen atom.

3,654,255

PROCESS FOR THE SEPARATION OF MIXTURES OF FATTY ACIDS AND ROSIN ACIDS

Adolf Koebner, Cumberland, England

No Drawing. Filed Feb. 6, 1970, Ser. No. 9,447

Int. Cl. C09f *1/04*

U.S. Cl. 260—97.6 **12 Claims**

A process for the separation of a mixture of fatty and rosin acids, in which a mixture of fatty acids in the form of esters, and rosin acids is neutralized by reaction with an alkali-metal or ammonium base in aqueous solution and in the presence of at least one mole (per mole of rosin acid) of an alkali-metal or ammonium aryl or alkylaryl sulfonate. The mixture is allowed to stand until it separates into two layers, the upper layer consisting of the fatty acid esters and the lower layer containing the alkali-metal or ammonium salts of the rosin acids, and the two layers are then mechanically separated and their constituents recovered. This process is particularly applicable for removing unsaponifiables from crude tall oil.

3,654,256

PAPER SIZE FROM NEUTRALS-FREE RESIN ACIDS

Glen W. Hedrick, Lake City, Fla., Hugh B. Summers, Jr., Savannah, Ga., and John B. Lewis, Lake City, Fla., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Mar. 25, 1969, Ser. No. 810,379

Int. Cl. C09f *1/04*

U.S. Cl. 260—105 **3 Claims**

Alkaline salts of resin-acids-containing materials were converted to sodium resinates, the resinates were refluxed in acetone, the solids separated from the liquids, and the solids dried to yield a neutrals-free product useful as an improved paper size.

3,654,257

DIAZO DERIVATIVES OF IMIDAZOLE CARBOXYLIC ACID ESTERS

Charles A. Krauth, Taejon Presbyterian College, Teajon, Korea, and Yoder Fulmer Shealy and Clinton Allen O'Dell, both of 2000 9th Ave. S., Birmingham, Ala. 35204

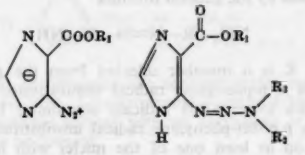
No Drawing. Original application Sept. 14, 1967, Ser. No. 667,659. Divided and this application Apr. 28, 1970, Ser. No. 51,747

Int. Cl. A61l *13/00;* **C07c** *113/00, 115/00*

U.S. Cl. 260—141 **4 Claims**

The present invention relates to certain derivatives of the imidazole heterocyclic ring which is a 5-membered diazo structure containing two nitrogen atoms and two double bonds. Since tautomeric structures are possible, substituents in the 4 and 5 positions are written thus, 4(or 5) and 5(or 4). The present compounds are diazo derivatives of imidazole carboxylic acid esters. The formulas for the compounds of the present invention and subsequently triazeno products are set out below:

FORMULA I



R_1=C_1–C_8 alkyl, diethylaminoethyl, and acid addition salts thereof,

R_2=alkyl, substituted alkyl, aryl,

R_3=H, alkyl, substituted alkyl and aryl.

3,654,258

DISPERSE YELLOW DYE OF 5-(2-NITRO-p-ANISYLAZO) BARBITURIC ACID

Donald Edward McKay, 249–A S. 8th Ave., Highland Park, N.J. 08904

No Drawing. Filed Aug. 27, 1969, Ser. No. 853,539

Int. Cl. C09b *29/36*

U.S. Cl. 260—154 **1 Claim**

A colorfast strong yellow disperse dye is prepared by coupling 2-nitro-p-anisidine to barbituric acid to form 5-(2-nitro-p-anisylazo) barbituric acid, m. 305–6° C. It dyes polyesters and organic derivatives of cellulose (including acetate and triacetate), and nylons in greenish yellow shades.

3,654,259

CATIONIC TRIAZOLEAZOINDOLE DYESTUFFS

Masao Iizuka, Norio Igari, and Shigeo Maeda, Tokyo, Japan, assignors to Hodogaya Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

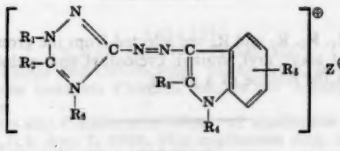
Filed May 15, 1969, Ser. No. 824,773

Claims priority, application Japan, May 20, 1968, 43/33,540

Int. Cl. C09b *29/36;* **D06p** *3/52, 3/76*

U.S. Cl. 260—157 **8 Claims**

New water-soluble quaternized cationic monoazo dyestuffs represented by the general formula



wherein R_1, R_2, R_3, R_4, R_5, R_6 and $Z^{\ominus}$ have the meanings respectively defined in the description and claims.

The new cationic monoazo dyestuffs are suitable for dyeing various fibrous materials such as mordant-treated cellulose fibres, acetate fibres, paper, silk, leather, synthetic fibres, especially fibres of polyacrylonitrile, polyesters and interpolymers thereof and the like. Greenish yellow to reddish yellow shades of the dyeings thus obtained are characterized by their excellent fastness to sunlight, washing, rubbing and heat and their almost complete lack of phototropism.

3,654,260

AZOBENZENE

Eishun Tsuchida, Tokyo, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

No Drawing. Filed Jan. 26, 1970, Ser. No. 5,994
Claims priority, application Japan, Feb. 3, 1969, 44/7,311
Int. Cl. C09b 27/00; C07c 107/06
U.S. Cl. 260—205 8 Claims

Process for preparing aromatic diamine azo compounds represented by the general formula

$$NH_2—R—N=N—R—NH_2$$

wherein R is a member selected from the group consisting of a p-phenylene radical unsubstituted or substituted with lower alkyl radicals containing 1–3 carbon atoms; a p,p'-bis-phenylene radical unsubstituted or substituted on at least one of the nuclei with lower alkyl radicals containing 1–3 carbon atoms and a p,p'-methylene-bis-phenylene radical unsubstituted or substituted on at least one of the nuclei with lower alkyl radicals containing 1–3 carbon atoms which comprises reacting at least one aromatic diamine represented by the general formula

$$NH_2—R—NH_2$$

where R is as defined above while feeding oxygen in the presence of a metal complex in which a transition metal ion is coordinated with an unsubstituted or alkyl-nuclear substituted pyridine and water (hydroxyl group) and or C_1–C_3 alkyl-substituted aniline.

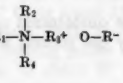
3,654,261

QUATERNARY AMMONIUM ALKOXIDE ALKOXY POLYOL COMPOUNDS

Calvin K. Johnson, Palos Heights, Ill., assignor to CPC International Inc.

No Drawing. Filed June 27, 1968, Ser. No. 740,450
Int. Cl. C07c 47/18, 85/00
U.S. Cl. 260—210 R 11 Claims

Covers epoxy resin compositions derived from reacting an uncured epoxy resin and an epoxy resin flexibilizer comprising a polyol quaternary ammonium alkoxide, preferably in presence of a curing agent, which resin compositions have desired strength and flexibility and resistance to chemical and solvent attack. Also covers cured epoxy resin compositions derived from the above combination of ingredients. Lastly, covers the flexibilizer compositions themselves which have the following structural formula:



where R_1, R_2, R_3 and R_4 are selected from the group consisting of alkyl, aryl, aralkyl, cycloalkyl and cycloheteryl and R is the residue of a polyol.

3,654,262

3-DEOXY-3-C-LOWER ALKYL GLYCOSIDES AND NUCLEOSIDES

Edward Walton, Scotch Plains, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed Aug. 21, 1969, Ser. No. 852,097
Int. Cl. C07d 47/18, 51/52, 51/54
U.S. Cl. 260—210 R 9 Claims

Novel 3 - deoxy - 3 - C-lower-alkyl-β-D-xylofuranosyl halide intermediates are prepared by the steps of (A) forming the 5-O-trityl derivative of an alkyl 2,3-anhydro-β-D-ribofuranoside, (B) reacting with a lower alkyl Grignard reagent to obtain the alkyl 3-deoxy-3-C-lower-alkyl - 5 - O-trityl-β-D-xylofuranoside, (C) removal of 5 - O - trityl group, (D) acylating to the alkyl 2,5-di-O - acyl - 3 - deoxy-3-C-lower-alkyl-β-D-xylofuranoside, and (E) converting the latter compound to the 2,5-di-O-acyl-3-deoxy-3-lower-alkyl-D-xylofuranosyl halide by a halogen replacement reaction. Steps C and D may be reversed. The novel intermediate is then converted into novel purine and pyrimidine nucleosides. The novel compounds of this invention have utility in vitro in inhibiting cell growth. They are also useful as screening agents for ultraviolet light.

3,654,263

STARCH DERIVATIVES, PROCESSES FOR MAKING THEM, COMPOSITIONS BASED UPON THE STARCH DERIVATIVES AND METHODS OF MAKING THE COMPOSITIONS

Richard W. Cescato, Chicago, Ill., assignor to CPC International Inc.

No Drawing. Filed Dec. 30, 1966, Ser. No. 608,720
Int. Cl. C08b 19/06
U.S. Cl. 260—233.3 R 16 Claims

This application covers a process for producing starch derivatives by oxidizing a starch that has been reacted with a reagent that introduces a positive electric charge into the starch molecule, under conditions such that the reaction product has residual unreacted hydroxyl groups. The degree of substitution of the cationic-type constituents is from about 0.01 to about 0.1. Also covered are the derivatives thus produced. The carboxyl groups present in the molecule, as a result of the oxidation, are preferably in sufficient quantity that the ratio of the percentage of carboxyl groups by weight, dry basis, to the degree of substitution with the said substituent is at least 1 to 1.

The application is also addressed to paper coating compositions containing, as at least a part of the starch binder for the composition, a novel starch derivative of the kind just described.

Also covered are methods of making the paper coating compositions containing the novel starch derivatives.

3,654,264

N-CYCLOHEXYL-3-GUANIDINOAZETIDINE

Tetsuya Okutani and Akinobu Nagaoka, Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Higashiku, Osaka, Japan

No Drawing. Filed Feb. 3, 1970, Ser. No. 8,428
Claims priority, application Japan, Feb. 11, 1969, 44/9,954
Int. Cl. A61k 27/00; C07d 25/00
U.S. Cl. 260—239 A 3 Claims

N-cyclohexyl-3-guanidinoazetidine and salts thereof are useful as hypertensive agents.

3,654,265

SYNTHETIC PENICILLIN

John Michael Essery, Fayetteville, and Janet Ruth West, Manlius, N.Y., assignors to Bristol-Myers Company, New York, N.Y.

No Drawing. Filed Nov. 27, 1970, Ser. No. 93,433
Int. Cl. C07d 99/12
U.S. Cl. 260—239.1 6 Claims

Pivaloyloxymethyl 6 - (D -α - sulfoaminophenylacetamido)penicillanate sodium salt (I) is a valuable antibiotic agent, nutritional supplement in animal feed, therapeutic agent in poultry and animals, including man, and is especially useful in the treatment of infectious diseases caused by Gram-positive and Gram-negative bacteria, most particularly those caused by the Pseudomonas genus, Sodium pivaloyloxymethyl 6-(D-α-sulfoaminophenylacet-

amido)penicillanate is prepared by the treatment of disodium 6-(D-α-sulfoaminophenylacetamido)penicillanate (II) with chloromethyl pivalate in hexamethylphosphortriamide. Compound I has a similar antibacterial spectrum to that of compound II but is absorbed from the gastro-intestinal tract 2–3 fold more efficiently than compound II.

3,654,266

INTERMEDIATES FOR PREPARING SEMI-SYNTHETIC PENICILLINS AND METHODS OF PRODUCTION

Charles A. Robinson, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

No Drawing. Filed May 8, 1968, Ser. No. 727,688
Int. Cl. C07d *99/16*
U.S. Cl. 260—239.1 **20 Claims**

The new compounds are (a) organosilane derivatives of 6-aminopenicillanic acid, which are prepared by the reaction of 6-aminopenicillanic acid or a salt thereof with a di- or tri-halosilane in the presence of an acid acceptor. Said organosilane derivatives of 6-aminopenicillanic acid are soluble in organic solvents and are readly acylatable with acylating agents to provide new compounds (b) which are organosilane derivatives of penicillins that readily provide, on hydrolysis or alcoholysis, the corresponding penicillns known to have useful antbiotic activity.

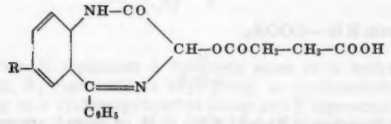
3,654,267

PROCESS FOR THE RESOLUTION OF RACEMIC 3-SUCCINYLOXY - 5 - PHENYL-1,3-DIHYDRO-2H-1,4 - BENZODIAZEPINE - 2-ONE-DERIVATIVES INTO OPTICAL ANTIPODES

Giancarlo Jommi and Giovanna Riva, Milan, Francesco Mauri, Sesto San Giovanni, and Luigi Mauri, Villa Santa, Italy, assignors to Ravizza S.A., Lausanne, Switzerland

No Drawing. Filed Mar. 25, 1970, Ser. No. 22,673
Claims priority, application Great Britain, Apr. 8, 1969, 18,034/69; Feb. 28, 1970, 9,759/70
Int. Cl. C07d *53/06*
U.S. Cl. 260—239.3 **5 Claims**

Invention concerned with a process for the resolution into optical antipodes of racemic compounds comprised in the general formula



(I)

wherein R is NO_2, Cl, F, Br, based on the sharply different solubility in ethylacetate of the salts of the dextro-forms and levo-forms with (+)ephedrine or (−)ephedrine.

3,654,268

PRODUCTION OF CAPROLACTAM

Edwin George Edward Hawkins, Lower Kingswood, Surrey, England, assignor to BP Chemicals (U.K.) Limited, London, England

No Drawing. Filed Dec. 9, 1968, Ser. No. 782,475
Claims priority, application Great Britain, Dec. 15, 1967, 57,228/67
Int. Cl. C07d *41/06*
U.S. Cl. 260—239.3 A **10 Claims**

Cyclohexanone is converted to 1,1'-peroxydicyclohexylamine which is then heated in the liquid phase to produce caprolactam and cyclohexanone, which cyclohexanone is recycled as feed to the process.

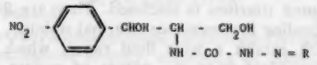
3,654,269

1-4-SUBSTITUTED SEMICARBAZIDES AND METHODS OF OBTAINING THEM

Antonio Luis Palomo Coll, Maestro Perez Cabrero 7, Barcelona, Spain

No Drawing. Filed Mar. 20, 1969, Ser. No. 809,038
Int. Cl. C07c *133/02*
U.S. Cl. 260—240 A **18 Claims**

A 1-4-substituted semicarbazide of the formula



The method of obtaining the semicarbazides essentially comprises reacting 1-p-nitrophenyl-2-amino-1,3-propanediol in a suitable solvent with an alkylidene or benzylidene amino isocyanate.

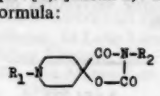
3,654,270

1-OXA-3,8-DIAZASPIRO[4,5]DECAN-2,4-DIONES

Susumu Umemoto, Sakai-shi, Akio Maki, Kyoto, and Keiji Nakamura, Neyagawa-shi, Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Osaka, Japan

No Drawing. Filed June 4, 1969, Ser. No. 830,530
Int. Cl. C07d *93/14*
U.S. Cl. 260—243 AA **9 Claims**

1-oxo-3,8-diazaspiro[4,5]decan-2,4-diones represented by the following formula:



which are novel chemical compounds useful as psychotropic agent with an extremely low toxicity, and to a process for the manufacture thereof.

3,654,271

PROCESS FOR PREPARING SIMPLE AND SUBSTITUTED MORPHOLINES

Arthur Lamendin, Bernard Matel, and Jean Dhenin, Bethune, France, assignors to Societe de Produits Chimiques Marles-Kuhlmann, Paris, France

No Drawing. Filed Apr. 25, 1969, Ser. No. 819,471
Claims priority, application France, Apr. 26, 1968, 149,680
Int. Cl. C07d *87/26*
U.S. Cl. 260—247 **10 Claims**

The present invention concerns a new process for preparing simple or substituted morpholines by dehydration of amino-alcohols chlorohydrates.

3,654,272

X-RAY CONTRAST MEDIA

Ernst Felder and Davide Pitre, Milan, Italy, assignors to Bracco Industria Chimica, Societa per Azioni, Milan, Italy

No Drawing. Continuation-in-part of application Ser. No. 814,164, Apr. 7, 1969. This application Aug. 13, 1969, Ser. No. 849,858
Claims priority, application Switzerland, May 2, 1968, 6,627/68
Int. Cl. C07c *103/32*
U.S. Cl. 260—247.2 R **4 Claims**

The di-(3-carboxy-2,4,6-triiodoanilides) of 4,7,10-trioxatridecane-1,13-dioic acid and 4,7,10,13-tetraoxahexadecane-1,16-dioic acid and the non-toxic water-soluble salts thereof with metals and amines are effective, well-tolerated X-ray contrast media which tend to accumulate in the gall bladder when their aqueous solutions are injected intravenously.

3,654,273
TRISUBSTITUTED TRIAZINES

Paul D. Schuman, Eugene C. Stump, Jr., and Stephen Rochow, Gainesville, Fla., assignors to PCR, Inc.

No Drawing. Continuation-in-part of application Ser. No. 655,713, July 6, 1967. This application May 31, 1968, Ser. No. 733,304
Int. Cl. C07d 55/50
U.S. Cl. 260—248 CS 5 Claims

A series of high molecular weight fluorinated alkyl trisubstituted triazines is disclosed. They are fluids having outstanding fire resistance, thermal stability, lubricity, and which exhibit a wide fluid range, which may be varied dependent upon the nature of certain disclosed polyfluoroalkyl substituents on the 2, 4 and 6 position of the s-triazine ring.

3,654,274
PHOSPHORUS-CONTAINING TRIAZINES

Leon H. Chance and Jerry P. Moreau, New Orleans, La., assignors to the United States of America as represented by the Department of Agriculture

No Drawing. Filed June 9, 1970, Ser. No. 44,864
Int. Cl. C07d 55/20
U.S. Cl. 260—249.8 2 Claims

New processes for preparing aminoalkoxyphosphinyl-1,3,5-triazines and processes for producing flame resistant cellulosic materials by treating the cellulosic materials with the formaldehyde derivatives of the aminoalkoxyphosphinyl triazines.

3,654,275
QUINOXALINECARBOXAMIDE ANTIINFLAMMATORY AGENTS

James M. McManus, Old Lyme, Conn., assignor to Chas. Pfizer & Co., Inc., New York, N.Y.

No Drawing. Filed Oct. 15, 1969, Ser. No. 866,732
Int. Cl. C07d 51/78
U.S. Cl. 260—250 R 8 Claims

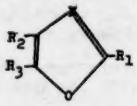
1,2,3,4-tetrahydro - 1 - acyl-3-oxo-2-quinoxalinecarboxamides, a novel class of heterocyclic compounds possessing antiinflammatory activity.

3,654,276
PROCESS FOR MANUFACTURING IMIDAZOLES

Walter Hafner, Bavaria, Germany, assignor to Consortium fur Electrochemische Industrie G.m.b.H., Bavaria, Germany

No Drawing. Filed Sept. 3, 1968, Ser. No. 757,166
Claims priority, application Germany, Sept. 2, 1967, P 16 70 459.9
Int. Cl. C07d 49/36
U.S. Cl. 260—268 H 3 Claims

Process for manufacturing imidazoles, by reacting an oxazole of the general formula



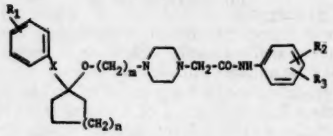
where R_1 is hydrogen, an aliphatic or araliphatic radical containing no carbon-carbon double bond in alpha position with respect to the ring, and R_2 or R_3 are hydrogen, an aliphatic or an aromatic radical with primary amines of the general formula NH_2R where R is an aliphatic, such as an alkyl radical of up to 18 carbon atoms, which may be substituted by hydroxyl-, ether, amino or alkylamino groups, araliphatic or aromatic radical, with a hydrogen ion splitting compound having a dissociation constant in water of at least 10^{-10}.

3,654,277
1 - [PHENYLALKYL-CYCLOALKYLOXYALKYL]-PIPERAZINYL-4-ACETIC ACID-ANILIDE COMPOUNDS AND THERAPEUTIC COMPOSITIONS

Werner Winter and Max Thiel, Mannheim, Kurt Stach, Wolfgang Schaumann, and Karl Dietmann, Mannheim-Waldhof, and Wolfgang Juhran, Mannheim, Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Postfach, Germany

No Drawing. Filed Sept. 15, 1969, Ser. No. 858,168
Claims priority, application Germany, Sept. 19, 1968, P 17 95 362.7
Int. Cl. C07d 51/70
U.S. Cl. 260—268 R 8 Claims

Basic ethers having the formula



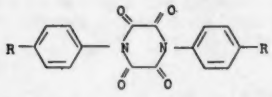
wherein R_1, R_2 and R_3 each represent hydrogen, halogen, lower alkyl, alkoxy or trifluoromethyl, X is a valency bond or a methylene group, *n* is a whole number of from 1 to 8 and *m* is 2 or 3, and their pharmaceutically acceptable salts, having cardiovascular activity.

3,654,278
ARYL-SUBSTITUTED TETRAKETOPIPERAZINE MONOMERS

Marvin T. Tetenbaum, Convent, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Oct. 29, 1969, Ser. No. 872,366
Int. Cl. C07d 51/68
U.S. Cl. 260—268 PH 2 Claims

Compounds of the structure:



wherein R is —$COOR_1$,

or —Br, wherein R^1 is H, CH_3, C_2H_5 or phenyl, are useful monomers for the preparation of polymers which, when blended with nylons, polyethylene terephthalate or poly (1,4-cyclohexylenedimethylene terephthalate), advantageously modify the properties thereof. The compound of the above structure, wherein R=CH_3, has insecticidal properties.

3,654,279
COMPLEX OF THE FORMULA $PdL(CO)X_2$ WHERE L IS HETEROAROMATIC NITROGEN COMPOUND AND X IS A HALIDE

Thomas J. Hurley, Jr., Madison, and Martin A. Robinson, Orange, Conn., assignors to Olin Mathieson Chemical Corporation

No Drawing. Filed June 21, 1968, Ser. No. 738,829
Int. Cl. C07d 35/18
U.S. Cl. 260—270 6 Claims

A new composition of matter having the formula

$PdL(CO)X_2$

where L is a Lewis base and where X is a halogen. This composition is prepared by reacting carbon monoxide with a Lewis base and a palladium-containing material selected from the group consisting of

(a) palladium dihalide
(b) a mixture of elemental palladium with an acid halide, and
(c) mixtures thereof,

in the presence of a liquid reaction medium. The resulting complex is useful as a catalyst in the preparation of organic isocyanates by reacting carbon monoxide with an organic nitro compound.

The Lewis base is a heteroaromatic nitrogen compound having a heteroaromatic ring which contains

(a) 5 or 6 members in the ring,
(b) only nitrogen and carbon in the ring,
(c) no more than 2 nitrogens in the ring, and
(d) at least 2 double bonds in the ring.

Typical heteroaromatic nitrogen compounds include pyridine and isoquinoline.

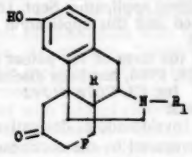
3,654,280

L-N ALLYLIC-3-HYDROXY-6-OXOMORPHINANS

Yoshiro Sawa, Ashiya-shi, Hyogo, Ryozo Maeda, Osaka-shi, Osaka, and Haruhiko Tada, Toyonaka-shi, Osaka, Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

No Drawing. Filed Mar. 17, 1969, Ser. No. 807,917
Claims priority, application Japan, Mar. 21, 1968, 43/18,385
Int. Cl. C07d *43/32*
U.S. Cl. 260—285 **4 Claims**

An L-3-hydroxy-6-oxomorphinan compound represented by the formula:



wherein R represents a hydrogen atom or a hydroxyl group, R_1 represents an allyl group, a γ,γ-dimethylallyl group or a cyclopropylmethyl group and F represents the presence or absence of a double bond, being useful as a narcotic antagonist, is prepared by introducing the substituent at the N-position.

3,654,281

3-SUBSTITUTED-2,3,4,5,6,7,8,12b-OCTAHYDRO-(1H)-[1,4]DIAZEPINO[7,1-a]ISOQUINOLINES

Thomas Alfred Montzka, Manlius, and John Daniel Matiskella, Liverpool, N.Y., assignors to Bristol-Myers Company, New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 862,161, Sept. 24, 1969. This application July 24, 1970, Ser. No. 58,169
Int. Cl. C07d *57/02*
U.S. Cl. 260—286 R **18 Claims**

3 - phenethyl - 2,3,4,5,6,7,8,12b-octahydro-(1H)-[1,4] diazepino[7,1-a]isoquinolines and derivatives thereof are compounds possessing interesting pharmacological activities, i.e., analgetic properties.

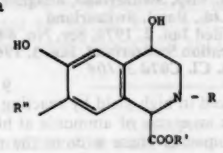
3,654,282

1,2,3,4-TETRAHYDRO-ISOQUINOLINE 1-CARBOXYLIC ACIDS

Jean-Pierre Fourneau and Jean Delourme, Paris, France, assignors to Laboratoires Houde, Paris, France

No Drawing. Filed Aug. 21, 1969, Ser. No. 852,081
Claims priority, application France, Mar. 9, 1970, 164,817
Int. Cl. C07d *35/10*
U.S. Cl. 260—287 **2 Claims**

New tetrahydroisoquinoline derivatives having in particular anti-tussive activity, consisting of compounds of formula



in which R and R', which may be the same or different, represent hydrogen or a lower alkyl group of 1–8 carbon atoms and R'' is hydrogen or hydroxy group, or a mutual salt of the cis and trans forms of this compound when R'=H.

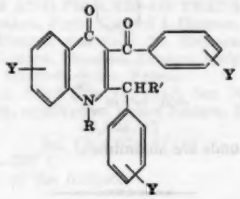
3,654,283

2-ARALKYL-3-AROYLQUINOLONES

Kenneth Robert Huffman, 24 Lolly Lane, Stamford, Conn. 06903; Edwin Fisher Ullman, 135 Selby Lane, Atherton, Calif. 94025; and Myrna Loy, 4654 Hazel Ave., Philadelphia, Pa. 19143

No Drawing. Continuation of application Ser. No. 739,136, June 24, 1968, which is a continuation-in-part of application Ser. No. 418,295, Dec. 14, 1964. This application May 13, 1970, Ser. No. 37,426
Int. Cl. C07d *33/46*
U.S. Cl. 260—289 R **1 Claim**

2-aralkyl-3-aroylquinolones are prepared which have the formula



wherein R and R' are hydrogen, lower alkyl or phenyl-substituted lower alkyl and Y is hydrogen, hydroxy, cyano, nitro, halogen, phenyl, tolyl, lower alkyl, alkoxy or alkylthio or di(lower alkylamino). They are prepared by ring-closing the corresponding 2-aroyl-3-anilino-4-arylcrotonates. Photochromic compounds may then be obtained by salt formation and alkylation.

3,654,284

13-SUBSTITUTED DIBENZO[b,g]QUINOLIZINES

John T. Suh, Mequon, and Richard A. Schnettler, Milwaukee, Wis., assignors to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Filed Nov. 3, 1969, Ser. No. 873,647
Int. Cl. C07d *39/12*
U.S. Cl. 260—289 R **8 Claims**

The compounds are 13-substituted dibenzo[b,g]quinolizines which are useful as central nervous system depressants and agents to control aggressive antisocial behavior in animals. The compounds also may be used as inter-

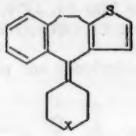
mediates in the preparation of pickling agents, mothproofing agents and wood preservatives. Representative of compounds disclosed are 2,3-dimethoxy-13-hydroxy-13 - phenyl - 5,7,12,13 - tetrahydro-12aH-dibenzo[b,g] quinolizine and 2,3 - dimethoxy-13-hydroxy-13-(3,4-dichlorophenyl) - 5,7,12,13 - tetrahydro-12aH-dibenzo[b,g] quinolizine.

3,654,285
PROCESS FOR THE MANUFACTURE OF β-PICOLINE
Enrico Catalucci, Visp, Switzerland, assignor to Lonza Ltd., Basel, Switzerland
No Drawing. Filed Jan. 2, 1970, Ser. No. 448
Claims priority, application Switzerland, Jan. 3, 1969, 4/69
Int. Cl. C07d *31/04*
U.S. Cl. 260—290 P **9 Claims**

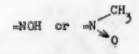
β-Picoline is produced in high yield by reacting a 1,1,3-trialkoxypropane with an excess of ammonia at high temperature in a liquid aqueous phase without the need for any catalyst.

3,654,286
PIPERIDYLIDENE SUBSTITUTED CYCLOHEPTA[1,2-b]THIOPHENES
Jean-Michel Bastian, Birsfelden, and Gustav Schwarb, Allschwil, Switzerland, assignors to Sandoz Ltd. (also known as Sandoz AG), Basel, Switzerland
No Drawing. Filed Jan. 28, 1970, Ser. No. 6,586
Claims priority, application Switzerland, Feb. 7, 1969, 1,872/69
Int. Cl. C07d *29/36*
U.S. Cl. 260—293.57 **1 Claim**

The invention concerns novel compounds of the formula:



wherein X is



The compounds are antaminics.

3,654,287
SPIROINDANYLPIPERIDINES
Stanley J. Dykstra, Evansville, Ind., assignor to Mead Johnson & Company, Evansville, Ind.
No Drawing. Filed Aug. 26, 1970, Ser. No. 67,242
Int. Cl. C07d *29/28*
U.S. Cl. 260—293.62 **7 Claims**

A class of compounds comprised of 3-phenylspiroindanylpiperidines having substituents on the piperidine nitrogen selected from the group consisting of hydrogen, lower alkyl, benzyl, phenethyl, dialkylaminoethyl, and alkoxy carbonyl, have been discovered. These compounds are useful as an antiulcler, analgesic and local anesthetic agents. One method of preparation is by heating 1,1-bis-(2-dialkylaminoethyl)-3-phenylindenes to eliminate trialkylamines. Subsequent dealkylation provides 3-phenylspiro[indene-1,4'-piperidine] which is reacted with an ester having the Formula RX wherein X is a reactive leaving group and R is the desired piperidine substituent. The 3-phenylspiroindenylpiperidines are converted to the corresponding 3-phenylspiroindanylpiperidines in the presence of hydrogen. Illustrative of the embodiments are 3-phenylspiro[indan-1,4'-piperidine] hydrochloride and 1'-(2-dimethylaminoethyl)-3-phenylspiro[indan-1,4' - piperidine] dihydrochloride.

3,654,288
2-(2-PIPERIDYL)ACETAMIDES
Joseph Hellerbach, Basel, Switzerland, assignor to Hoffmann-La Roche, Inc., Nutley, N.J.
No Drawing. Original application Mar. 28, 1967, Ser. No. 626,387, now Patent No. 3,515,725, dated June 2, 1970. Divided and this application Mar. 6, 1970, Ser. No. 17,321
Claims priority, application Switzerland, Apr. 6, 1966, 5,052/66
Int. Cl. C07d *29/30*
U.S. Cl. 260—293.76 **3 Claims**

2,3a-diazahydrindanone and 3H-pyrido-[1,2-c]pyrimidin-3-one derivatives useful as analgesics, antiphlogistics, anti-allergics and anti-inflammatory agents.

3,654,289
CERTAIN DERIVATIVES OF 5-H[4,3-b] AND 9-H[3,4-b]-1,2,3,4-TETRAHYDROPYRIDOINDOLES
Gerard Y. Paris, Duvernay, Quebec, and David L. Garmaise, Montreal, Quebec, Canada, assignors to Abbott Laboratories, Chicago, Ill.
No Drawing. Filed Apr. 9, 1970, Ser. No. 27,116
Int. Cl. C07d *31/42, 31/44*
U.S. Cl. 260—295 C **7 Claims**

A new series of closely related compounds, the β- and γ-carbolines, carrying simple substituents in specific positions of the molecule were found to be highly effective against *T. cruzi* in very low concentrations.

3,654,290
INTERMEDIATES FOR 5-(PYRIDYLALKYL) PYRIDOINDOLE DERIVATIVES
Leo Berger, Montclair, and Alfred John Corraz, Wayne, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.
No Drawing. Original application Sept. 10, 1968, Ser. No. 758,712. Divided and this application Mar. 27, 1970, Ser. No. 23,438
The portion of the term of the patent subsequent to Dec. 16, 1986, has been disclaimed
Int. Cl. C07d *31/42*
U.S. Cl. 260—296 R **17 Claims**

5-(pyridylalkyl)pyridoindole derivatives having antiallergic activity, prepared by the condensation of the correspondingly substituted 4-piperidones and N-amino-N-arylaminoalkylpyridines, are described.

3,654,291
CERTAIN 3-AMINO-2(1H)-PYRIDONES
Bruce E. Witzel and Tsung-Ying Shen, Westfield, Patricia M. Graham, Mountainside, Robert L. Clark, Woodbridge, and Arsenio A. Pessolano, Colonia, N.J., assignors to Merck & Co., Inc., Rahway, N.J.
No Drawing. Filed Nov. 12, 1969, Ser. No. 876,059
Int. Cl. C07d *31/42*
U.S. Cl. 260—296 R **7 Claims**

Novel primary and tertiary aminopyridones useful as antiinflammatory, analgesic and antipyretic agents.

3,654,292
MANUFACTURE OF 3,5-DICHLORO-2,6-DIFLUORO - 4 - HYDROXYPYRIDINE AND SALTS THEREOF
Robert Roberts, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England
No Drawing. Filed Oct. 9, 1969, Ser. No. 865,162
Int. Cl. C07d *31/30*
U.S. Cl. 260—297 R **3 Claims**

A process for the manufacture of 3,5-dichloro-2,6-difluoro-4-hydroxypyridine or salt thereof which comprises

the step of interacting 3,5-dichloro-2,4,6-trifluoropyridine and an aqueous solution of a carbonate or bicarbonate of sodium or potassium. The compounds produced by the aforementioned process are known herbicidal agents.

3,654,293
2- AND 4-(3,4,4-TRIFLUORO-3-BUTENYL-THIO)PYRIDINES
Mervin E. Brokke, Richmond, Calif., assignor to Stauffer Chemical Company, New York, N.Y.
No Drawing. Original application Sept. 27, 1965, Ser. No. 490,664. Divided and this application Nov. 20, 1969, Ser. No. 877,539
Int. Cl. C07d *31/50*
U.S. Cl. 260—294.8 G **2 Claims**

The 2- and 4-(3,4,4-trifluoro-3-butenyl-thio)pyridines of this invention are prepared by reacting the appropriate thiol compound, namely (2- or 4-pyridinethiol), with 3,4,4-trifluoro-3-butenyl bromide in the presence of a hydrogen halide acceptor, (tertiary amine). The compounds of this invention are effective nematocides.

3,654,294
CERTAIN ISOTHIAZOLYLACETYLENE-MERCAPTIDES
Raymond Urgel Lemieux and Rintje Raap, Edmonton, Alberta, Canada, assignors to R & L Molecular Research Ltd., Edmonton, Alberta, Canada
No Drawing. Original application July 27, 1967, Ser. No. 656,351, now Patent No. 3,464,999, dated Sept. 2, 1969. Divided and this application June 17, 1969, Ser. No. 834,137
Int. Cl. C07d *91/12*
U.S. Cl. 260—302 A **8 Claims**

Various substituted carboxylic acids such as 5-isothiazolylacetic acid are valuable intermediates in the preparation of new and novel antibacterial agents. A new process for the preparation of these acids has been devised, a typical example of which is the reaction of the product from the reaction of isothiazole with butyl lithium with acetic anhydride to produce 5-acetylisothiazole. The 5-acetylisothiazole is reacted with carbethoxyhydrazine to produce the corresponding hydrazone. The resultant hydrazone is treated with thionyl chloride to produce 4-(5'-isothiazolyl)-1,2,3-thiadiazole, which in turn is converted to 1-methylthio-2-(5'-isothiazolyl)-ethyne by treatment first with butyl lithium and then dimethylsulfate. Hydrolysis of this product produces 5-isothiazolylacetic acid. Condensation of this acid with 6-aminopenicillanic acid (6-APA) or 7-aminocephalosporanic acid (7-ACA) produces the corresponding 6-(5'-isothiazolylacetamido) derivatives of penicillanic and cephalosporanic acids. This application claims the alkali metal alkynylmercaptide intermediates and the process for their preparation.

3,654,295
PROCESS FOR THE PRODUCTION OF 2-HALO-5-NITROTHIAZOLES
Erich Däbritz and Karl Heinrich Mayer, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed July 28, 1969, Ser. No. 845,487
Claims priority, application Germany, Aug. 10, 1968, P 17 95 106.3
Int. Cl. C07d *91/32*
U.S. Cl. 260—302 R **2 Claims**

In the manufacture of a 2-halo-5-nitrothiazole by the diazotisation of 2-amino-5-nitrothiazole with a hydrohalic acid, the reaction is carried out in the absence of a catalyst and in a dilute aqueous solution of the acid, preferably at a temperature of −10° to 10° C.

3,654,296
2-CHLOROBENZOTHIAZOLECARBOXAMIDES
William A. Bolhofer, Frederick, Pa., assignor to Merck & Co., Inc., Rahway, N.J.
No Drawing. Filed Jan. 10, 1969, Ser. No. 790,458
Int. Cl. C07d *91/44*
U.S. Cl. 260—304 **15 Claims**

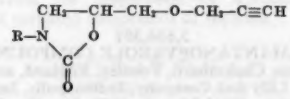
2-chlorobenzothiazolecarboxamides, useful new agents for inhibiting gastric acid secretion, are prepared by reacting 2 - chlorobenzothiazolecarbonyl halide with an amino compound of the general formula R_1—NH—R_2 where R_1 and R_2 are hydrogen, alkyl, cycloalkyl, alkenyl, hydroxyalkyl, alkoxyalkyl, dialkylaminoalkyl, aryl, aralkyl or with a 5 or 6-membered heterocyclic compound formulated by joining R_1 and R_2 with or without the inclusion of hetero atoms such as O, N, S.

3,654,297
PROCESS FOR OXIDIZING 2-MERCAPTO-BENZOTHIAZOLE
George Constantine Goulandris, Brooklyn, N.Y., assignor to American Cyanamid Company, Stamford, Conn.
No Drawing. Filed Feb. 10, 1969, Ser. No. 798,138
Int. Cl. C07d *91/48*
U.S. Cl. 260—306.5 **6 Claims**

A process for oxidizing 2-mercaptobenzothiazole by heating an organic solution thereof, containing less than 15% water in the presence of a free-oxygen containing gas and a catalytic amount of a cobalt phthalocyanine sulfonate at a temperature between 25° C. and 200° C. The product 2,2'-dithiobisbenzothiazole is produced in significant amounts by conducting the reaction at a temperature of from about 50° C. to 80° C., while the product 2,2'-thiobisbenzothiazole is produced in significant amounts when the reaction temperature is from about 130° C. to 180° C.

3,654,298
ACETYLENIC DERIVATIVES OF 2-OXAZOLIDINONES AND PROCESS OF PREPARATION
Colette A. Douzon, Paris, Gérard J. Huguet, Malesherbes, Claude I. Fauran and Guy M. Raynaud, Paris, and Claude J. Gouret, Meudon, France, assignors to Delalande S.A., Hauts-de-Seine, France
No Drawing. Filed Oct. 14, 1968, Ser. No. 767,473
Claims priority, application Great Britain, Oct. 20, 1967, 47,886/67
Int. Cl. C07d *85/28*
U.S. Cl. 260—307 C **3 Claims**

Compounds of the formula



in which R is:

a saturated, straight or branched-chain aliphatic radical having 1 to 6 carbon atoms;

an arylaliphatic radical selected from the group consisting of benzyl and benzhydryl;

a radical selected from the group consisting of phenyl and phenyl substituted by one or more of the following radicals:

halogen,

alkoxy having 1 to 4 carbon atoms,

aliphatic having 1 to 5 carbon atoms,

a nitrogen containing group selected from the group consisting of nitro and acetamido, trifluoromethyl,

acyl of formula —CO—R_3 in which R_3 is an aliphatic radical having 1 to 4 carbon atoms,

a radical selected from the group consisting of —$COOR_4$ and —CH_2COOR_4, in which R_4 is hydrogen or an alkyl radical having 1 to 4 carbon atoms,

a radical selected from the group consisting of hydroxyl and —$OCOR_5$ wherein R_5 is an alkyl radical having 1 or 2 carbon atoms,

an α- or β-naphthyl radical.

The compounds have myorelaxing, sedative, analgesic, anti-inflammatory, antipyretic, tranquilizing and anticonvulsive properties.

3,654,299

NITROIMIDAZOLYL ANTIMICROBIAL AGENTS

Goro Asato, Titusville, and Gerald Berkelhammer, Princeton, N.J., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Dec. 8, 1969, Ser. No. 883,237
Int. Cl. C07d *49/36*
U.S. Cl. 260—309 **11 Claims**

Substituted nitroimidazoles are prepared, for example, by reacting 2-cyano-1-substituted-5-nitroimidazole with hydroxylamine to produce the corresponding 1-substituted - 5 - nitro-2-imidazolecarboxamidoxime. The latter compound may be reacted with a loweralkyl haloformate to produce 1 - substituted-5-nitro-2-imidazolecarboxamidoxime, O-(loweralkyl carbonates). Other compounds are also described. The compounds are useful for controlling protozoan and bacterial infections. They are also useful as herbicides and as intermediates in preparing other nitroimidazolyl heterocycles useful for controlling microorganisms in warm-blooded animals.

3,654,300

IMIDAZOLINE PHOSPHORAMIDES

Derek Redmore, Ballwin, Mo., assignor to Petrolite Corporation, Wilmington, Del.

No Drawing. Original application Nov. 25, 1966, Ser. No. 596,798, now Patent No. 3,524,908. Divided and this application Apr. 7, 1970, Ser. No. 26,439
Int. Cl. C07d *49/34*
U.S. Cl. 260—309.6 **6 Claims**

Phosphoramides formed from imidazolines and esters of phosphorous acids, such as dialkyl or dialkynyl phosphites, useful in preventing corrosion of iron, steel and ferrous alloys in oil wells producing oils or oil-brine mixtures and also in the clarification of water containing suspended matter.

3,654,301

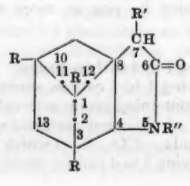
ADAMANTANOPYRROLE COMPOUNDS

Jiban Kumar Chakrabarti, Frimley, England, assignor to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Filed May 1, 1969, Ser. No. 821,112
Claims priority, application Great Britain, May 21, 1968, 24,089/68
Int. Cl. C07d *27/30*
U.S. Cl. 260—325 **2 Claims**

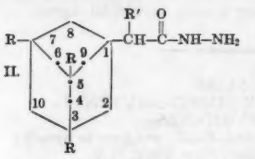
Adamantanopyrrole compounds of the formula:

I.

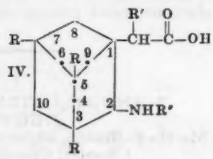


and intermediates for the synthesis of these compounds, the intermediates being of the formulae:

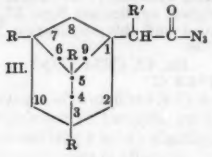
II.



IV.



III.



The adamantanopyrrole compounds are useful as anti-inflammatory agents and as CNS depressants.

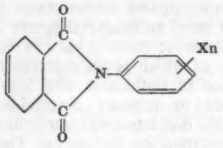
3,654,302

TETRAHYDROPHTHALANILS

Herbert Schwartz, 1963 N. Maurice River Parkway, Vineland, N.J. 08360, and Joseph B. Skaptason, 12700 Prospect Ave., Rte. 30, Kansas City, Mo. 64146

No Drawing. Continuation-in-part of application Ser. No. 539,266, Apr. 1, 1966, now Patent No. 3,507,904. This application Jan. 30, 1970, Ser. No. 7,223
Int. Cl. C07d *27/52*
U.S. Cl. 260—326 **17 Claims**

Tetrahydrophthalanils of the formula



I

wherein X is at least one member of the group consisting of halogen, lower alkyl and lower alkoxy of 1 to 7 carbon atoms, halogenated lower alkyl of 1 to 7 carbon atoms, sulfamoyl, lower alkylenedioxy of 1 to 4 carbon atoms and

wherein R and R_1 are selected from the group consisting of hydrogen and lower alkyl of 1 to 7 carbon atoms and *n* is an integer of 1 to 5 which compounds possess interesting pesticidal herbicidal activities.

3,654,303

5-BROMO-4-OXO-4,5,6,7-TETRAHYDROINDOLES AND METHODS OF PREPARING SAME

William Alan Remers, Suffern, N.Y., and Martin Joseph Weiss, Oradell, N.J., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Jan. 6, 1970, Ser. No. 1,043
Int. Cl. C07d *27/54*
U.S. Cl. 260—326.12 R **7 Claims**

This disclosure describes compounds of the class of 5-bromo-4-oxo-4,5,6,7 - tetrahydroindoles useful as antifungal agents.

3,654,304

ALKYL 1,1a,2,6b-TETRAHYDROCYCLOPROP[b] INDOLE 1-CARBOXYLATES AND ACIDS

William John Welstead, Jr., Richmond, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

No Drawing. Filed Jan. 26, 1970, Ser. No. 5,897
Int. Cl. C07d 27/36
U.S. Cl. 260—326.3 8 Claims

Alkyl 2-substituted - 1,1a,2,6b - tetrahydrocycloprop[b] indole-1-carboxylates and the corresponding acids are disclosed. The compounds are prepared by reacting 1-acyl- and 1-carbamoyl-indoles with alkyl diazoacetates at 50–70° C. Two isomeric alkyl-2-substituted-1,1a,2,6b-tetrahydrocycloprop[b]indole-1-carboxylates are formed and are separated by column chromatography. The esters are designated as exo and endo isomers on the basis of their nuclear magnetic resonance spectra. The acids are prepared by basic hydrolysis of the esters.

3,654,305

5-AZASPIRO[2.4]HEPTANES

Victor Frederick German, Richmond, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

No Drawing. Filed Jan. 26, 1970, Ser. No. 5,896
Int. Cl. C07d 27/04
U.S. Cl. 260—326.5 R 7 Claims

5-azaspiro[2.4]heptanes prepared by metal hydride reduction of 5-azaspiro[2.4]heptane-4,6-diones having antidepressant activity are described.

3,654,306

5-AZASPIRO[2.4]HEPTANE-4,6-DIONES

Victor Frederick German, Richmond, Va., assignor to A. H. Robins Company, Inc., Richmond, Va.

No Drawing. Filed Jan. 26, 1970, Ser. No. 5,904
Int. Cl. C07d 27/10
U.S. Cl. 260—326.5 FM 10 Claims

5-azaspiro[2.4]heptane-4,6-diones useful as diuretics and intermediates for 5-azaspiro[2.4]heptanes are described. The compounds are prepared by a series of reactions starting from dialkyl itaconates and itaconic anhydride with substituted diazomethanes.

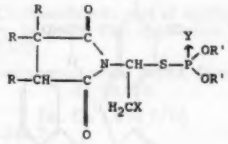
3,654,307

O,O-DIALKYL S-[2-HALO - 1 - (N-SUCCINIMIDO) ETHYL] PHOSPHOROTHIOATES AND PHOSPHORODITHIOATES AND INSECTICIDAL COMPOSITIONS CONTAINING THEM

Joel D. Jamison, 705 Abbey Road, Wilmington, Del. 19808

No Drawing, Continuation-in-part of application Ser. No. 603,747, Dec. 22, 1966. This application June 19, 1969, Ser. No. 835,909
Int. Cl. C07d 27/10
U.S. Cl. 260—326.5 A 16 Claims

Disclosed are O,O-dialkyl S-[2-halo-1-(N-succinimido) ethyl]phosphorothioates and phosphorodithioates of the structural formula:



wherein each R is selected from the group consisting of the hydrogen and R′ radicals with the maximum number of R radicals that can be R′ radicals being two, X is a halo radical, Y is selected from the group consisting of the oxo and thioxo radicals, and each R′ is a C_1–C_7 alkyl radical. These compounds are useful as insecticides.

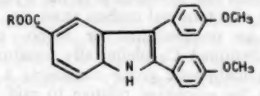
3,654,308

2,3-BIS(p-METHOXYPHENYL)-INDOLE-5-CARBOXYLIC ACID DERIVATIVES

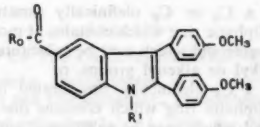
Jacob Szmuszkovicz, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Original application Jan. 27, 1969, Ser. No. 794,402, now Patent No. 3,565,912. Divided and this application Aug. 19, 1970, Ser. No. 65,315
Int. Cl. C07d 27/56
U.S. Cl. 260—326.13 R 3 Claims

Intermediates having the formula:



wherein R=H, C_2H_5 or $-CH_2-CH_2OH$ are used to produce anti-inflammatory indoles of the formula:



wherein R_o is hydrogen or lower-alkyl and R′ is hydrogen, lower-alkyl or lower-alkanoyl.

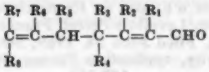
3,654,309

PROCESS FOR THE PREPARATION OF UNSATURATED ALDEHYDES

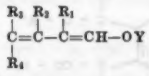
Alan Francis Thomas, Vernier, Geneva, Switzerland, assignor to Firmenich & Cie, Geneva, Switzerland

No Drawing. Filed May 22, 1968, Ser. No. 731,277
Claims priority, application Switzerland, May 26, 1967, 7,511/67; Sept. 29, 1967, 13,652/67; May 10, 1968, 6,972/68
Int. Cl. C07d 63/12, 5/16; C07c 45/00
U.S. Cl. 260—332.3 R 24 Claims

A process for preparation of α,β-olefinically unsaturated carbonyl compounds of formula

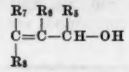


by condensing, with a condensing agent at 60° to 400° C., a butadienyl ether (or a substance which generates such ether) of formula



wherein Y is a linear or branched C_1–C_4 alkyl radical, or a benzyl, p-nitrobenzyl or furfuryl radical and R_1, R_2, R_3 and R_4 each is hydrogen or a linear or branched C_1–C_6 alkyl radical, with an allyl alcohol containing at least

three carbon atoms and at least four carbon atoms less than the end product, of formula



wherein R_5, R_6, R_7 and R_8 each is hydrogen, or

(a) a linear or branched C_1–C_8 alkyl radical, or

(b) a linear or branched C_2–C_8 olefinically unsaturated hydrocarbon radical containing at most two double bonds, or

(c) R_5, R_6 and one of R_7 and R_8 each is as defined in (a) or (b) above and the other of R_7 and R_8 is an ethyl radical substituted on its terminal carbon atom with:

(1) an unsubstituted or mono- or di-methyl-substituted C_5 or C_6 olefinically unsaturated cycloaliphatic group containing at most two double bonds one of which is in the α-position relative to said terminal carbon atom, or

(2) an unsubstituted or mono- or di-methyl-substituted C_7 olefinically unsaturated bridged cycloaliphatic group containing a double bond in the α-position relative to said terminal carbon atom, or

(3) a 2- or 3-furyl or a 2- or 3-thienyl group,

and two of the above-defined radicals R_5, R_6, R_7 and R_8 may be linked to each other (except R_5 to R_6) to form:

(4) a C_5 or C_6 olefinically unsaturated cycloaliphatic ring which contains at most two double bonds and which may be substituted with C_1–C_3 alkyl or alkenyl groups, or

(5) a C_6 olefinically unsaturated bridged cycloaliphatic ring which contains one double bond and which may be substituted with one or two methyl groups, or

(6) a furan or thiophene ring which may be substituted with a methyl group.

Allyl alcohols and unsaturated hydrocarbons are also prepared by reducing the carbonyl compounds obtained as aforesaid.

Compounds obtained in the foregoing three categories have valuable odoriferous and/or flavoring properties and are useful in the manufacture of perfumes, perfumed products, foodstuffs and beverages. In many cases, the compounds are also useful as intermediates for synthesizing other odoriferous and/or flavoring compounds.

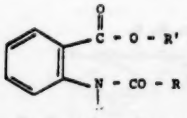
3,654,310

ANTHRANILIC ACID DERIVATIVES

Pierre J. Queval, Sainte-Genevieve-des-Bois, and Bernard L. M. Falconnet, Le Vesinet, France, assignors to Serdex-Societe d'Etudes de Recherches de Diffusion et d'Exploitation, Levallois-Perret, France

No Drawing. Filed June 24, 1969, Ser. No. 836,132
Claims priority, application France, June 28, 1968, 157,061
Int. Cl. A61k *27/00;* **C07d** *63/12, 63/14*
U.S. Cl. 260—332.2 C **6 Claims**

Anthranilic acid derivatives of formula:



(I)

in which R is a thienyl group optionally substituted with halogen and R′ is hydrogen or an alkaline-earth metal, having inflammatory, antalgic and anti-pyretic activity.

3,654,311

POLYCYCLIC DIOLS AND PROCESS FOR PREPARING THE SAME

Arsene Isard, St. Genis, Laval, and Francis Weiss, Pierre Benite, France, assignors to Ugine Kuhlmann, Paris, France

No Drawing. Original application Jan. 4, 1968, Ser. No. 695,572. Divided and this application May 25, 1970, Ser. No. 48,682
Claims priority, application France, Jan. 6, 1967, 90,194
Int. Cl. C07d *13/04*
U.S. Cl. 260—340.9 **1 Claim**

4 - hydroxy-1-methylol-6-oxa (3.2.1)-bicyclo-octane, 4-hydroxy - 1 - methylol-6-oxa ($3.2.1.1^{3,8}$)-tricyclo-nonane, and 4-hydroxy-1-methylol-6,8-dioxa (3.2.1 -bicyclo-octane are prepared by reacting in the presence of a catalyst such as tungstic acid, a peracid with a cyclic diol such as 1,1-dimethylol - 3-cyclohexene, 2,2-dimethylol-5-norbornene, 2,2-dimethylol-3,4-dihydro (2H) pyrane. The peracid may be prepared in situ by reacting hydrogen peroxide with a carboxylic acid.

3,654,312

NOVEL 6-OXO-7,8,9,10-TETRAHYDRO-6H-DIBENZO[b,d]PYRANS

Harry G. Pars, Lexington, and Felix E. Granchelli, Arlington, Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

No Drawing. Continuation-in-part of application Ser. No. 642,187, May 29, 1967. This application May 21, 1970, Ser. No. 39,539
Int. Cl. C07d *7/26*
U.S. Cl. 260—343.2 R **3 Claims**

A series of novel 7,8,9,10-tetrahydro-6H-dibenzo[b,d] pyrans and 7,8,9,10,11,12-hexahydro - 6H - dibenzo[b,d] pyrans having C.N.S. and cardiovascular activity and 6-oxo-7,8,9,10-tetrahydro-6H-dibenzo[b,d]pyrans used as intermediates in the preparation thereof.

3,654,313

2-OXONAPHTHO-(2,1-b)-FURAN-6-α-CARBOXYLIC ACID DERIVATIVES

Howard Jones, Holmdel, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed Aug. 19, 1970, Ser. No. 65,320
Int. Cl. C07d *5/34*
U.S. Cl. 260—343.3 **2 Claims**

2-oxonaphtho(2,1-b)furan-6-α-carboxylic acid derivatives useful as anti-inflammatory agents.

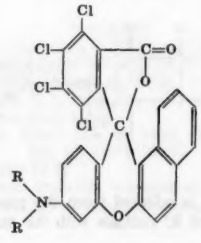
3,654,314

TETRACHLORINATED CHROMOGENIC COMPOUNDS

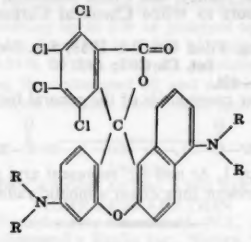
Sheldon Farber and Arthur John Wright, Dayton, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

No Drawing. Filed Nov. 3, 1970, Ser. No. 86,644
Int. Cl. C07d *5/34*
U.S. Cl. 260—343.3 **2 Claims**

A chromogenic material of normally colorless form is disclosed having the structural formula:



or



wherein each R is hydrogen or an alkyl radical having 1 to 4 carbon atoms.

3,654,315

ORGANIC PSEUDO PERESTERS

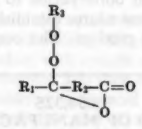
Yun Ger Chang and Philip S. Bailey, Austin, Tex., assignors to Reichhold Chemicals, Inc., White Plains, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 585,777, Oct. 11, 1966. This application June 3, 1969, Ser. No. 830,112

Int. Cl. C07d *5/06, 5/34*

U.S. Cl. 260—343.3 **15 Claims**

Organic pseudo peresters of the general formula:



wherein R_1 is an alkyl group or an alkaryl group (aryl substituted alkyl) preferably containing no more than 12 carbon atoms or an aryl group with or without substituents; R_2 can be part of an aromatic nucleus with or without substituents or can be part of an alicyclic ring system or have the formula $(CH_2)_n$ wherein n is an integer preferably in the range 2 to 4 and R_3 is an alkyl or alkaryl group preferably a tertiary alkyl or alkaryl group having utility as cross-linking agents, catalysts or initiators in polymerization reactions such as styrene vinyl acetate polyethylene and methyl methacrylate.

3,654,316

METHOD OF PREPARING COMENIC ACID AND DERIVATIVES THEREOF

Shunichiro Oga and Kazuo Asano, Osaka, and Katsumi Imada, Kyoto, Japan, assignors to Daiichi Seiyaku Company, Ltd., Tokyo, Japan

No Drawing. Continuation-in-part of application Ser. No. 784,171, Dec. 16, 1968. This application Oct. 16, 1969, Ser. No. 867,059

Claims priority, application Japan, Dec. 15, 1967, 42/80,050

Int. Cl. C07d *7/16*

U.S. Cl. 260—345.7 **18 Claims**

A method for preparing a compound selected from the group consisting of comenic acid and its metal salt, which comprises heating an aqueous solution of a member selected from the group consisting of 2,5-diketo-gluconic acid and its metal salt selected from the group consisting of alkaline earth metal salts and alkali metal salts.

3,654,317

EPOXIDATION PROCESS

John F. Harrod, Mont St. Hilaire, Quebec, Allan R. Knight, Petrolia, Ontario, and John S. McIntyre, Sarnia, Ontario, Canada, assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Jan. 19, 1970, Ser. No. 4,037

Int. Cl. C07d *1/08, 1/12*

U.S. Cl. 260—348.5 L **6 Claims**

A process for producing epoxides comprising oxidizing in the liquid phase an olefin via an organic hydroperoxide in the presence of at least one of $Mo(CO)_6$ and $W(CO)_6$ as a catalyst, wherein a solution of the olefin and the catalyst have been heated to a temperature of from 50° C. to the reflux temperature of the olefin for at least 5 minutes prior to the epoxidation. The resulting activated catalyst allows epoxidation reactions at lower temperatures or shorter contact times, thereby lowering hydroperoxide losses through decomposition.

3,654,318

METHOD OF PREPARING ETHYLENE OXIDE

John F. Kucirka, Northampton, Pa., assignor to Air Products and Chemicals Inc., Philadelphia, Pa.

No Drawing. Application July 11, 1969, Ser. No. 841,691, now Patent No. 3,565,828, dated Feb. 23, 1971, which is a continuation-in-part of application Ser. No. 699,027, Jan. 19, 1968, now Patent No. 3,472,787. Divided and this application June 23, 1970, Ser. No. 59,769

Int. Cl. C07d *1/14*

U.S. Cl. 260—348.5 R **2 Claims**

A catalyst composition, conveniently designated as silver aluminate monohydrate, functions as a catalyst for the synthesis of ethylene oxide from oxygen and ethylene. The catalyst had 65±5% silver, a pore volume of 0.6 to 1.5 cc./g., and a surface area of 100–600 $m.^2/g$. The catalyst is so active that acceptable conversions are obtained below 192° C., the critical temperature of ethylene oxide.

3,654,319

ANTHRAQUINONE DYESTUFFS

Rutger Neeff, Leverkusen, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

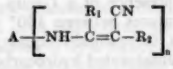
No Drawing. Filed May 3, 1967, Ser. No. 635,648

Claims priority, application Germany, May 3, 1966, F 49,089

Int. Cl. C09b *1/26, 1/50*

U.S. Cl. 260—376 **12 Claims**

Anthraquinone dyestuffs of the formula

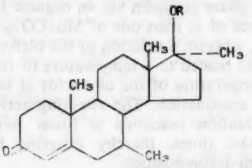


in which A is a substituted or unsubstituted anthraquinone radical; R_1 is H, substituted or unsubstituted hydrocarbon;

R_2 is CN or a carboxylic acid ester radical; and n is a number from 1 to 4; and their preparation by condensation of N-anthraquinonyl-N'-amidinium salts with cyanoacetic acid esters or malonic dinitrile in the presence of acid-binding agents, e.g. alkali metal oxide, hydroxides carbonates, are disclosed.

3,654,320
ORGANIC PROCESSES
Donald Emory Ayer, John C. Babcock, and J. Allan Campbell, Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.
No Drawing. Filed Mar. 24, 1970, Ser. No. 22,382
Int. Cl. C07c *169/20*
U.S. Cl. 260—397.4 36 Claims

This invention relates to novel processes for preparing the known useful compounds of the formula



wherein R is selected from the group consisting of hydrogen and the acyl radical of a hydrocarbon carboxylic acid containing from one through twelve carbon atoms. It also relates to novel intermediates obtained in the course of carrying out the aforesaid novel processes. Two alternative methods for producing the compounds embraced by the above formula (designated Process A and Process B) can be employed and are described below. The systemic administration of the compounds of the above formula produces a favorable anabolic effect in humans and animals due to their favorable anabolic:androgenic ratio. These compounds are also useful as gonadatropin inhibitors.

3,654,321
17α-METHYLENECYCLOPROPYL- AND 17α-SPIROPENTYL STEROIDS AND PROCESS
John H. Fried, Palo Alto, Calif., and Pierre Crabbe, Mexico City, Mexico, assignors to Syntex Corporation, Panama, Panama
No Drawing. Filed Aug. 4, 1970, Ser. No. 60,943
Int. Cl. C07c *169/20*
U.S. Cl. 260—397.4 19 Claims

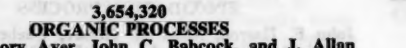
17α - methylenecyclopropyl and 17α - spiropentyl steroids of the androstane, estrane, and estrogen series which are novel estrogenic, anti-androgenic, progestational, and anti-fertility agents, and a process for the preparation of such compounds.

3,654,322
REACTION OF A CARBOXYLIC ACID ANHYDRIDE WITH AN ETHYLENICALLY UNSATURATED HYDROCARBON
Donald M. Fenton, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.
No Drawing. Filed June 10, 1969, Ser. No. 831,981
Int. Cl. C07c *51/54*
U.S. Cl. 260—398 16 Claims

A carboxylic acid anhydride is contacted with an ethylenically unsaturated hydrocarbon under liquid phase conditions in the presence of a Group VIII noble metal catalyst at temperatures between 100° and 300° C. and pressures sufficient to maintain liquid phase conditions. The ethylenically unsaturated hydrocarbon reacts with the anhydride to replace the hydrocarbon group of the anhydride. The reaction is especially useful in converting branched-chain anhydrides to straight-chain anhydrides.

3,654,323
SULFONE-ESTER COMPOUNDS
John R. Clark, Nutley, and Claire Bluestein, Glen Rock, N.J., assignors to Witco Chemical Corporation, New York, N.Y.
No Drawing. Filed Oct. 24, 1969, Ser. No. 869,362
Int. Cl. C07c *143/90*
U.S. Cl. 260—400 6 Claims

Sulfone-ester compounds of the general formula



where n is 0 or 1, Ar and Ar' represent aryl radicals, and R and R' represent long chain aliphatic radicals.

3,654,324
SYNTHESIS OF METHYL STERCULATE
Walter J. Gensler, Belmont, Mass., assignor to the United States of America as represented by the Secretary of Agriculture
No Drawing. Filed Mar. 31, 1970, Ser. No. 24,339
Int. Cl. C07c *69/74, 61/18*
U.S. Cl. 260—410.9 R 2 Claims

This invention relates to the preparation of methyl sterculate and the preparation of a new intermediate, the diacid chloride of 9,10-(carboxymethano)-9-octadecenoic acid. Methyl stearolate and diazoacetic ester react in the presence of copper bronze to form methyl 9,10-carbethoxymethano)-9-octadecenoate (70%). Saponification followed by treatment with oxalyl chloride gives the corresponding bis-acid chloride. Exposure to anhydrous zinc chloride at room temperature leads to loss of carbon monoxide and to generation of a cyclopropenium ion-acid chloride intermediate. After esterification with methanol, the resulting cyclopropenium ion-ester is reduced with sodium borohydride to give methyl sterculate. A number of procedures established the identify and homogeneity of the product. The overall yield is in the order of 30%.

3,654,325
METHOD OF MANUFACTURING COTTONSEED OIL
Irina Andreevna Bashkutskaya, Raziezzhaya ulitsa 2, kv. 3; and Alla Borisovna Belova, Novo-Izmailovsky prospekt 19, kv. 57, both of Leningrad, U.S.S.R.; Semen Timofeevich Borschev, Ulitsa Karla Libknekhta 51; and Valentin Ivanovich Vlasov, Stroitelnaya ulitsa 1, kv. 41, both of Kokand, U.S.S.R.; Vasily Markovich Govor, Ulitsa imeni Usmana Jusupova 83; and Boris Idelevich Grinvald, Ulitsa Chimkentskaya 5, both of Tashkent, U.S.S.R.; Jury Alexeevich Zhabin, Ulitsa Pravdy 51, Kokand, U.S.S.R.; Yanina Andreevna Koneva, Ulitsa 40 let Oktyabrya 9, kv. 1; and Valentina Nikolaevna Popova, Kzhar Kurganskaya ulitsa 19, kv. 10, both of Tashkent, U.S.S.R.; Vladimir Petrovich Rzhekhin, Ulitsa Tjushina 3, kv. 5, Leningrad, U.S.S.R.; Vitaly Broneslavovich Rubnikovich, Ulitsa Litvinova 22; and Grigory Vladimirovich Rozenshtein, Ulitsa Pravdy 39, both of Kokand, U.S.S.R.; Alexandr Georgievich Sergeev, Ulitsa Tjushina 3, kv. 6; and Basya Yakovlevna Sterlin, Drezdenskaya ulitsa 20, kv. 29, both of Leningrad, U.S.S.R.; Usyaslav Iosifovich Trosko, Ulitsa Khalkabad 10; and Ravia Davlyatovna Sharipova, Massiv Chilanzar 1, kvartal 59, kv. 4, both of Tashkent, U.S.S.R.; Ivan Vasilievich Gavrilemco, Sofiiskaya naberezhnaya 33, korpus 3, kv. 97, Leningrad, U.S.S.R.; Semen Fedorovich Kiporenko, Dmitrovskoe shosse 5/1, kv. 67, Moscow, U.S.S.R.; and Anatoly Grigorievich Neschadim, Prospekt Slavy 19, korpus 1, kv. 199, Leningrad, U.S.S.R.
No Drawing. Filed Apr. 23, 1969, Ser. No. 828,412
Int. Cl. C09f *5/02*
U.S. Cl. 260—412.4 6 Claims

A method of manufacturing cottonseed oil, which comprises removing 60–80% of gossypol from the cottonseed into the cottonseed oil, followed by separating the gossypol from the cottonseed oil by a specific reagent, wherein

the cottonseed is conditioned and decorticated, the meats are crushed, heated and processed to obtain the cottonseed oil containing up to 2% of gossypol and the solvent cake containing from 0.2 to 0.4% of combined gossypol and up to 0.01% of free gossypol, provision being made for subjecting the cottonseed oil and solutions thereof to treatment with an aromatic amino acid, such as anthranilic acid.

3,654,326

5,9-DIOXODECANOIC ACIDS AND METHODS FOR THEIR PREPARATION

Michael Rosenberger, Bloomfield, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed July 22, 1970, Ser. No. 57,362
Int. Cl. C08h *17/36*
U.S. Cl. 260—413 **6 Claims**

5,9-dioxodecanoic acid or the 3-alkyl substituted analogs thereof are prepared from 4-optionally substituted alkyl - 6 - (4,4-ethylenedioxypentyl)-tetrahydropyran-2-ols by chromic acid oxidation utilizing two alternative procedures. The product, 5,9-dioxodecanoic acid or its 3-alkyl substituted analogs, are useful as a starting material in the total synthesis of optically active medicinally valuable steroids.

3,654,327

METHODS OF CONVERTING COCOA BUTTER TO FREE ACIDS

Charles S. Castner, Reading, Pa., assignor to Schuyler Development Corporation

No Drawing. Filed May 4, 1970, Ser. No. 34,602
Int. Cl. C11c *1/02*
U.S. Cl. 260—418 **5 Claims**

A method of converting cocoa butter to free acids is provided by the steps of melting the cocoa butter, reacting the melted cocoa butter with caustic at elevated temperature to complete hydrolysis and then reacting the resultant hydrolyzed cocoa butter with an acid to a maintained pH of 6.6 to 6.8 with agitation and washing and recovering the resultant reaction product.

3,654,328

POLYMERIC METAL DIALKARYLDITHIOPHOSPHATES

Thomas V. Liston, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Filed Mar. 19, 1970, Ser. No. 21,209
Int. Cl. C07f *3/06*
U.S. Cl. 260—429.9 **5 Claims**

Polymeric metal dialkaryldithiophosphates are produced by the reaction of an alkylene-di-p-phenol, phosphorus pentasulfide, and a Group II metal compound. Calcium, barium, and especially zinc are the preferred Group II metal. These polymeric materials show excellent thermal stability in the thermogravimetric test.

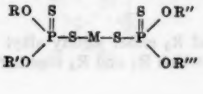
3,654,329

ZINC DITHIOPHOSPHATES

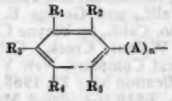
Luigi Imparato, Rome, Enzo Rossi, San Donato Milanese, and Sergio Del Ross, La Spezia, Italy, assignors to Snam Progetti S.p.A., Milan, Italy

No Drawing. Filed Dec. 3, 1968, Ser. No. 780,906
Claims priority, application Italy, Dec. 6, 1967, 23,582/67
Int. Cl. C07f *3/06*
U.S. Cl. 260—429.9 **6 Claims**

Anti-oxidants are disclosed having the formula:



wherein M is calcium, barium, nickel, cadmium, lead or zinc and R, R′, R″ and R‴ are substituted or unsubstituted hydrocarbon radicals, at least one having the formula:



wherein A is a bivalent hydrocarbon radical and *n* is zero or a whole number from 1 to 20 and at least one of said R_1, R_2, R_3, R_4 and R_5 groups is a hydroxy group sterically hindered by another of said groups which is an alkyl group. The remaining groups are hydrogen or alkyl.

3,654,330

TETRAACETONITRILOLITHIUM HEXAFLUOROPHOSPHATE, TETRAACETONITRILOLITHIUM HEXAFLUOROARSENATE AND METHOD FOR THE PREPARATION THEREOF

Robert A. Wiesboeck, Atlanta, Ga., assignor to United States Steel Corporation

No Drawing. Continuation-in-part of application Ser. No. 829,111, May 29, 1969. This application May 1, 1970, Ser. No. 33,883
Int. Cl. C07f *9/66*
U.S. Cl. 260—440 **5 Claims**

Tetraacetonitrilolithium hexafluorophosphate and tetraacetonitrilolithium hexafluoroarsenate, new compounds, and their preparation from lithium fluoride and PF_5 or previously prepared $LiPF_6$ with excess CH_3CN, and $LiAsF_6$ with excess CH_3CN, respectively, are disclosed. Tetraacetonitrilolithium hexafluorophosphate and tetraacetonitrilolithium hexafluoroarsenate are useful for the production of high purity exceptionally active $LiPF_6$ and $LiAsF_6$. The preparations of these new compositions are also disclosed.

3,654,331

DIANILINO ALUMINUM CHLORIDE

Oskar E. H. Klopfer, Baton Rouge, La., assignor to Ethyl Corporation, New York, N.Y.

No Drawing. Filed Dec. 10, 1968, Ser. No. 782,706
Int. Cl. C07f *5/06*
U.S. Cl. 260—448 R **1 Claim**

Aromatic amines having a hydrogen atom on at least one nuclear carbon atom ortho to an amine group (e.g., aniline) are selectively orthoalkylated by adding a catalytic amount of an alkyl aluminum halide such as diethyl aluminum chloride to the aromatic amine and then heating the resultant mixture to about 100–500° C. in the presence of an olefin. The process may also be carried out in the added presence of an aluminum anilide.

3,654,332

ORGANOFUNCTIONAL-SILICON MATERIALS

Abe Berger, Schenectady, N.Y., assignor to General Electric Company

No Drawing. Continuation-in-part of application Ser. No. 691,928, Dec. 20, 1967. This application July 18, 1969, Ser. No. 843,213
Int. Cl. C07f *7/02*
U.S. Cl. 260—448.2 N **9 Claims**

Certain bis(organofunctional-alkyl)silanes are provided. These materials have the formula:

(1) QQ′SiYY′

where Q is an organofunctional radical; Q′ is an organofunctional radical or a silalkylene group having an organofunctional radical; Y is a halide substituent; and Y′ is a halide substituent or a monovalent hydrocarbon radical, free of aliphatic unsaturation. The materials are useful as glass sizings, fabric stiffeners, metal protectants, and as intermediates for the production of various useful organopolysiloxanes.

3,654,333

3,4,4-TRIFLUORO-3-BUTENYLTHIO METHYLIDENE COMPOUNDS AND THEIR UTILITY

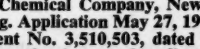
Mervin E. Brokke, Richmond, and Thomas B. Williamson, Santa Clara, Calif., and George E. Lukes, deceased, late of El Cerrito, Calif., by Wayne C. Jaeschke, special administrator, Walnut Creek, Calif., assignors to Stauffer Chemical Company, New York, N.Y.

No Drawing. Application May 27, 1968, Ser. No. 735,495, now Patent No. 3,510,503, dated May 5, 1970, which is a continuation-in-part of application Ser. No. 491,508, Sept. 27, 1965. Divided and this application Dec. 18, 1969, Ser. No. 888,114

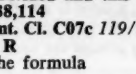
Int. Cl. C07c *119/00*

U.S. Cl. 260—453 R 6 Claims

Compounds of the formula



wherein X is a member selected from the group consisting of oxygen, sulfur, imino, phenylimino, chlorophenylimino, alkylimino containing from 1 to 8 carbon atoms, inclusive, and alkenylimino containing 2 to 4 carbon atoms, inclusive, R is selected from the group



wherein R^1 and R^2, individually, are selected from the group consisting of hydrogen, alkyl containing from 1 to 10 carbon atoms, inclusive, hydroxyalkyl containing from 1 to 4 carbon atoms, inclusive, alkenyl containing from 2 to 4 carbon atoms, inclusive, cycloalkyl containing from 4 to 6 carbon atoms, inclusive, phenyl, and R^1 and R^2 jointly are a divalent alkylene radical containing 4 to 6 carbon atoms, inclusive, and R^3 is selected from the group lower alkyl, chlorophenyl lower alkyl, and 3,4,4-trifluoro-3-butenyl. The above compounds are effective herbicides and nematocides.

3,654,334

PREPARATION OF ORGANIC THIOCYANATES AND SULFONATES FROM SULFONYL HALIDES OR CYANIDES

Richard Garth Pews, Fred P. Corson, and Edwin B. Nyquist, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Aug. 4, 1969, Ser. No. 847,397

Int. Cl. C07c *161/02*

U.S. Cl. 260—454 7 Claims

Organic thiocyanates are prepared by reacting the appropriate sulfonyl halide or sulfonyl cyanide in the liquid phase with a cyanide salt under essentially anhydrous reaction conditions to obtain the corresponding thiocyanate and sulfonate.

3,654,335

PROCESS FOR THE PREPARATION OF POLYHALOALKYL CHLOROSULFATES

David E. Young, Denville, Lowell R. Anderson, Parsippany, and William B. Fox, Morristown, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Nov. 29, 1968, Ser. No. 780,261

Int. Cl. C07c *143/68*

U.S. Cl. 260—456 R 21 Claims

Chlorosulfates of the formula:

$$R[OSO_2Cl]_n$$

wherein n is 1 or 2; R may be an open chain YZ-perhaloalkyl group when n is 1 or an open-chain YZ-perhaloalkylene group containing at least three carbon atoms when n is 2, wherein Y and Z are substituents on the R moiety and are the same or different electronegative groups; may be prepared by reacting hypochlorites of the formula $R—(OCl)_n$ wherein R and n are as defined above, with sulfur dioxide at a temperature below about 0° C. The chlorosulfate products are a known class of compounds and are useful as intermediates for the preparation of halogenated ketones, carboxylic acids, esters, thiolesters, amides, aldehydes and polyesters.

3,654,336

PREPARATION OF ISOPROPENYL-PHENYLISOCYANATES

Heinrich Krimm, Krefeld-Bochum, Hans Josef Buysch, Krefeld, and Hermann Schnell, Krefeld-Uerdingen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Aug. 8, 1968, Ser. No. 751,041

Claims priority, application Germany, Aug. 17, 1967, F 53,257

Int. Cl. C07c *119/04*

U.S. Cl. 260—453 PH 4 Claims

Isopropenyl-phenylisocyanates useful in preparing synthetic resins by the polyaddition reaction are prepared by reacting aminophenyl dimethyl carbinols with phosgene at an elevated temperature.

3,654,337

PREPARATION OF DIHYDROCARBYL CARBONATES FROM MONOALCOHOLS AND TRIHALOMETHANES

Donald M. Fenton, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

No Drawing. Filed Aug. 17, 1970, Ser. No. 64,555

Int. Cl. C07c *69/00*

U.S. Cl. 260—463 10 Claims

A method for the preparation of dihydrocarbyl carbonates from a trihalomethane is disclosed. In the process, a trihalomethane is contacted with a saturated aliphatic or alicyclic monoalcohol having from 1 to 20 carbon atoms in the presence of mercuric oxide or a mercuric salt and water at a temperature of from 0° to about 250° C. and a pressure sufficient to maintain liquid phase conditions to oxidize the trihalomethane to the dihydrocarbyl carbonate.

3,654,338

HALOFORMIC ACID ESTER ISOCYANATES

Heinrich Krimm, Krefeld-Bockum, and Hermann Schnell, Krefeld-Urdingen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Continuation-in-part of application Ser. No. 531,020, Mar. 2, 1966. This application Mar. 20, 1969, Ser. No. 809,010

Claims priority, application Germany, Mar. 3, 1965, F 45,411

Int. Cl. C07c *119/04*; C08g *22/04*

U.S. Cl. 260—463 7 Claims

Haloformic acid ester isocyanates are prepared by reacting a primary amino alcohol with phosgene.

3,654,339

METHOD FOR THE PRODUCTION OF SUBSTITUTED CYANOBUTYRIC ACIDS

Helmut aus der Fünten, Mondorf, and Hermann Richtzenhain, Schwellenbach, Germany, assignors to Dynamit Nobel AG, Troisdorf, Germany

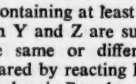
No Drawing. Filed Aug. 28, 1969, Ser. No. 853,920

Claims priority, application Germany, Sept. 4, 1968, P 17 93 347.0

Int. Cl. C07c *121/40*

U.S. Cl. 260—464 3 Claims

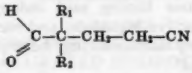
Method for the production of substituted 4-cyanobutyric acids of the general formula:



(I)

in which R_1 and R_2 either signify alkyl groups with 1–4 C-atoms, or in which R_1 and R_2 together with the carbon

atom to which they are attached form a carbocyclic ring, by oxidation of corresponding substituted 4-cyanobutyric aldehydes of the general formula:



(II)

in which R_1 and R_2 have the meaning indicated above, in which the oxidation is carried out with halogen in the presence of water.

3,654,340

CYANOACRYLATE MONOMER PROCESS

Elden H. Banitt, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Continuation-in-part of application Ser. No. 641,142, May 25, 1967, which is a continuation-in-part of application Ser. No. 595,324, Nov. 18, 1966. This application Aug. 27, 1970, Ser. No. 67,635

Int. Cl. C07c *121/48, 121/30, 121/52*

U.S. Cl. 260—465.4 **6 Claims**

A new step in the condensation of formaldehyde and esters of 2-cyanoacetic acid to produce 2-cyanoacrylate esters which consists essentially of catalyzing the reaction by means of a mixture of an acid and the salt of a primary or secondary amine with the same or stronger acid. To be effective, the catalytic mixture should have a pH value of 5 or less when exact amounts of its components are dissolved in 25 ml. of water. If the catalytic mixture is to include an acid which is not readily soluble in water (e.g. organic acids), then the pH is measured in 25 ml. of an ethanol-water mixture and subsequently corrected as described in J. Am. Chem. Soc., 75, 576 (1953).

3,654,341

CERTAIN DIFLUORAMINO NITRILE DERIVATIVES

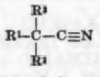
Robert J. Koshar, Lincoln Township, Washington County, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Filed Aug. 5, 1963, Ser. No. 300,956

Int. Cl. C07c *121/42*

U.S. Cl. 260—465.5 R **15 Claims**

2. A compound of the formula



in which R^1 is a member of the group consisting of —F, $—NF_2$ and —C≡N; R^2 is a member of the group consisting of $—NH_2$, —NFH and $—NF_2$; R^3 is a member of the group consisting of —NFH and $—NF_2$, and when R^1 is —C≡N, R^3 taken together with R^2 is additionally =NF; and when R^3 is $—NF_2$, R^2 is selected from the group consisting of $—NH_2$ and $—NF_2$.

3,654,342

FLAME-RETARDANT AGENTS FOR THERMOPLASTIC PRODUCTS

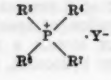
Helen Currier Gillham, Princeton, and Allan Ellis Sherr, Martinsville, N.J., and Harvey Gerald Klein, New York, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Application Aug. 13, 1965, Ser. No. 479,599, which is a continuation-in-part of application Ser. No. 296,364, July 19, 1963. Divided and this application Aug. 19, 1968, Ser. No. 753,739

Int. Cl. C07c *121/28*

U.S. Cl. 260—465.8 **1 Claim**

Compounds useful as flame-retarding agents and having the formula



wherein R^4 is carboxyalkenyl, carboalkoxyalkenyl or 2-cyanoethyl, R^5, R^6 and R^7, are, individually, alkyl; alkenyl; cyano, hydroxy, or carboxy substituted alkyl; aryl; aralkyl; vinyl, halo, polyhalo, or nitro ar-substituted aralkyl; dialkylaminoalkyl or carboalkoxyalkyl radicals and Y is bromine or chlorine, R^5, R^6 and R^7 being 2-cyanoethyl and Y being bromine when R^4 is 2-cyanoethyl and at least one of R^5, R^6 and R^7 being cyano substituted alkyl when R^4 is carboxyalkenyl or carboalkoyalkenyl, are disclosed.

3,654,343

SYNTHESIS OF SUBSTITUTED DIBENZO[d,f] AZONINES AND INTERMEDIATES

Arnold Brossi, Verona, and Benjamin Pecherer, Montclair, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Original application Feb. 17, 1967, Ser. No. 616,803, now Patent No. 3,452,295, dated July 22, 1969. Divided and this application Apr. 10, 1969, Ser. No. 815,232

Int. Cl. C07c *65/14, 69/76*

U.S. Cl. 260—473 R **1 Claim**

Alkoxy-substituted 6 - amino-5H-dibenzo[a,c]cycloheptene-7-carbonitriles and their preparation which carbonitriles are useful as intermediates in a step-wise synthesis of 3,4',5,5'-tetramethoxy-dibenzo[d,f]azonine and analogs.

3,654,344

SULFONIUM HALIDES AND DERIVATIVES THEREOF

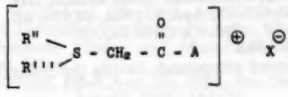
Kenneth Wayne Ratts, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Division of application Ser. No. 682,544, Nov. 13, 1967, now Patent No. 3,547,994, which is a division of application Ser. No. 467,750, June 28, 1965, now Patent No. 3,478,154. This application Feb. 5, 1970, Ser. No. 9,051

Int. Cl. C07c *149/20*

U.S. Cl. 260—481 R **3 Claims**

Sulfonium halides of the general formula



wherein X is chloro, bromo or iodo, wherein R'' and R''' are like or unlike lower alkyl, and wherein A is lower alkoxy. These compounds are useful intermediates for insecticides.

3,654,345

PREPARATION OF UNSATURATED ESTERS

Christian Robert Jentsch, Hamburg, Germany, assignor to The British Petroleum Company Limited, London, England

No Drawing. Filed May 21, 1969, Ser. No. 826,693

Claims priority, application Great Britain, June 17, 1968, 28,733/68

Int. Cl. C07c *69/54*

U.S. Cl. 260—486 R **13 Claims**

Methyl acrylate is prepared by reacting methanol with methyl acetate at elevated temperature in the presence of oxygen and a catalyst comprising silver or copper carried on an alumino-silicate support which has been treated with a base before the silver or copper is deposited.

3,654,346
POLY-ESTER-AMIDE-ACIDS
Richard L. Godar and Theodore Spanos III, St. Louis, Mo., assignors to Petrolite Corporation, Wilmington, Del.
No Drawing. Filed June 3, 1968, Ser. No. 733,788
Int. Cl. C07c *101/26*
U.S. Cl. 260—482 R **5 Claims**

The reaction products of (1) an alkyl or alkenyl succinic acid or an anhydride thereof (also referred to as ASAA) with (2) a polyol, preferably a diol and (3) an alkanolamine (the reaction products referred to as "Poly-Ester-Amide-Acids"). In the preferred embodiment (1) ASAA is reacted first with (2) a diol which is then reacted with (3) an alkanol amine which is then reacted with (4) ASAA; and to the uses for these products, particularly as rust and corrosion inhibitors.

3,654,347
ETHYLENICALLY UNSATURATED, HYDROXY-CONTAINING LACTONE PRODUCTS
Harrison S. Kincaid, Moorestown, and Fritz Hostettler, Verona, N.J., and Harry Vineyard, South Charleston, W. Va., assignors to Union Carbide Corporation
No Drawing. Filed May 3, 1968, Ser. No. 726,578
Int. Cl. C07c *69/66*
U.S. Cl. 260—484 R **10 Claims**

Monohydroxyl- and dihydroxyl-containing polylactones possessing at least one pendant polymerizable ethylenic group are prepared by reacting a lactone having from 4 to 6 carbon atoms in the ring, with an organic ethylenically unsaturated, hydroxy-containing initiator such as allyl alcohol, 1,1,1-trimethylolpropane monoallyl ether, etc. The resulting unsaturated polylactones are useful in preparing siloxane surfactants, unsaturated polyurethane gum stocks which can be cured to highly useful vulcanizates, etc.

3,654,348
N-HALOGENATED SULFONIC ACIDS AND ALKALI METAL SALTS THEREOF
Peter Robson and Frederick Edward Hardy, Newcastle-upon-Tyne, England, assignors to The Procter & Gamble Company, Cincinnati, Ohio
No Drawing. Filed Oct. 9, 1968, Ser. No. 766,326
Claims priority, application Great Britain, Oct. 11, 1967, 46,407/67; Apr. 9, 1968, 16,954/68
Int. Cl. C07c *143/56*
U.S. Cl. 260—508 **9 Claims**

N-halogenated compounds having the general formula

$$R-SO_2-N(X)-(CH_2)_3-SO_3M$$

wherein R is an alkyl, aryl or substituted aryl group, X is bromine or chlorine, and M is an alkali metal, are useful as bleaching agents and as disinfectants.

3,654,349
SUBSTITUTED INDENYL ACETIC ACIDS
Tsung-Ying Shen, Westfield, N.J., Richard B. Greenwald, Framingham, Mass., and Howard Jones, Matawan, Bruce O. Linn, Somerville, and Bruce E. Witzel, Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.
No Drawing. Continuation-in-part of abandoned application Ser. No. 848,736, Aug. 8, 1969. This application May 1, 1970, Ser. No. 33,891
Int. Cl. C07c *63/50*
U.S. Cl. 260—515 M **15 Claims**

New substituted indenyl acetic acids and nontoxic pharmaceutically acceptable amides, esters and salts derived therefrom. The substituted indenyl acetic acids disclosed herein have anti-inflammatory, anti-pyretic and analgesic activity. Also included herein are methods of preparing said indenyl acetic acid compounds, pharmaceutical compositions having said indenyl acetic acid compounds as an active ingredient and methods of treating inflammation by administering these particular compositions to patients.

3,654,350
PURIFICATION OF TEREPHTHALIC ACID
Enrique R. Witt and Jorge A. Blay, Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.
No Drawing. Filed Jan. 14, 1970, Ser. No. 2,962
Int. Cl. C07c *51/42*
U.S. Cl. 260—525 **10 Claims**

Disclosed herein are several processes for purifying terephthalic acid (TPA). The primary inventive concept disclosed herein exists in the use of a minor amount of water to suppress color formation.

A substantially homogeneous admixture of TPA, a small amount of water, and preferably an agent, e.g. acetic acid, to promote destruction of 4-carboxybenzaldehyde (CBA) is heated to the melting point of the admixture for a time sufficient to reduce the concentration of CBA to the desired level.

3,654,351
PURIFICATION OF AROMATIC POLYCARBOXYLIC ACIDS BY RECRYSTALLIZATION
Enrique Roberto Witt, Corpus Christi, Tex., assignor to Celanese Corporation, New York, N.Y.
No Drawing. Filed Nov. 18, 1969, Ser. No. 877,842
Int. Cl. C07c *51/42*
U.S. Cl. 260—525 **11 Claims**

A process for purifying crystalline aromatic polycarboxylic acids by recrystallization from liquid mixtures of 0 to 92% by weight water and 8 to 100 percent by weight of a phenol. For example terephthalic acid may be purified by recrystallization from a liquid mixture containing 30% phenol and 70% water.

3,654,352
PURIFICATION OF TEREPHTHALIC OR ISOPHTHALIC ACID
Enrique R. Witt, William J. Humphrey, and Arthur W. Schnizer, Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.
No Drawing. Filed Apr. 2, 1969, Ser. No. 812,859
Int. Cl. C07c *51/42, 51/48*
U.S. Cl. 260—525 **11 Claims**

A process for the purification of terephthalic and/or isophthalic acid by recrystallization of the impure acid from the solvent in the presence of a compound having the

$$-\overset{|}{N}NH_2$$

radical.

3,654,353
METHOD OF TREATING SPENT PULP LIQUORS
Gerrit G. de Haas, Longview, Leslie H. Clark, Kelso, and Charles J. Lang, Longview, Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.
Filed Oct. 23, 1964, Ser. No. 406,087
Int. Cl. C07c *53/10*
U.S. Cl. 260—527 R **5 Claims**

A method of recovering volatile, condensible organic acids, particularly acetic acid, present in the vapor stream obtained during evaporation of spent pulping liquor by injecting into the vapor stream a finely divided basic material, such as sodium hydroxide, to convert the acids

in the vapor stream to their non-volatile salts. The salts are subsequently separated from the residual vapor stream, primarily water vapor, by entrainment.

3,654,354
PROCESS FOR THE OXIDATION OF UNSATURATED HYDROCARBONS
Jean Blanc, Pau, France, assignor to Societe Nationale des Petroles d'Aquitaine, Paris, France
No Drawing. Filed June 4, 1968, Ser. No. 734,233
Claims priority, application France, June 5, 1967, 109,172
Int. Cl. C07c *57/04*
U.S. Cl. 260—533 N **10 Claims**

Oxidation of ethylenically unsaturated hydrocarbons by passage over a supported catalyst, the active substituent of which is phospho-vanado-molybdic acid or an ammonium, antimony or tellurium salt of such acid.

3,654,355
PROCESS OF PREPARING ADIPIC ACID BY THE NITRIC ACID OXIDATION OF CYCLOHEXANE
Werner H. Mueller, Gulf Breeze, and Charles R. Campbell and John J. Hicks, Jr., Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Nov. 19, 1969, Ser. No. 878,239
Int. Cl. C07c *55/04, 55/14*
U.S. Cl. 260—533 C **8 Claims**

In processes for the production of adipic acid by the oxidation of cyclohexane in the liquid phase with aqueous nitric acid at temperatures between 70° and 130° C. wherein a vanadium catalyst is employed and wherein the oxidation is conducted in the presence of an organic nitrocompound which is a solvent for the cyclohexane, substantial increases in the yield and production rate of adipic acid and substantial decreases in the formation of nitrated by-products are attained without a substantial increase in nitric acid consumption by introducing from about 0.2 to 5.0 moles of nitric oxide into the reacting mixture per mole of cyclohexane introduced.

3,654,356
OXIDATION OF p-TOLUIC ACID TO TEREPHTHALIC ACID
John W. Ager, Princeton, N.J., assignor to FMC Corporation, New York, N.Y.
No Drawing. Filed Apr. 1, 1970, Ser. No. 24,799
Int. Cl. C07c *63/02*
U.S. Cl. 260—524 R **2 Claims**

p-Toluic acid is oxidized to terephthalic acid by elemental oxygen at mildly elevated temperatures and pressures in the presence of a catalyst consisting of copper chloride, potassium chloride, hydrochloric acid and a rare-earth chloride of the group consisting of cerium, praseodymium and neodymium; cobalt chloride is an optional additional ingredient.

3,654,357
BICYCLIC SULFONYLTHIOUREA DERIVATIVES
Hermann Bretschneider, Innsbruck, Klaus Grassmayr, Sistrans, near Innsbruck, and Kraft Hohenlohe-Oehringen, Innsbruck, Austria, and Andre Grussner, Basel, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.
No Drawing. Filed Apr. 21, 1969, Ser. No. 818,141
Claims priority, application Switzerland, Apr. 26, 1968, 6,285/68
Int. Cl. C07c *157/00*
U.S. Cl. 260—552 R **4 Claims**

Bicyclic sulfonylurea derivatives and intermediates therefor have been prepared by various processes, for example, from the corresponding thiourea derivatives. The bicyclic sulfonylurea end products are useful as hypoglycemic agents.

3,654,358
OXIDATION OF HALOGENATED ETHYLENES
Gaines C. Jeffrey, Houston, Tex., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Continuation-in-part of application Ser. No. 672,955, Oct. 5, 1967. This application Apr. 24, 1970, Ser. No. 31,752
Int. Cl. C07c *51/58*
U.S. Cl. 260—544 Y **5 Claims**

This invention relates to the oxidation of halogenated ethylenes in the presence of a chemical initiator.

3,654,359
PROCESS FOR SYNTHESIZING SULFIMINIUM CHLORIDE
Eugene P. Gosselink, Colerain Township, Hamilton County, and Robert G. Laughlin, Springfield Township, Hamilton County, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
No Drawing. Filed Oct. 20, 1969, Ser. No. 867,924
Int. Cl. C07c *145/00*
U.S. Cl. 260—551 S **8 Claims**

Dialkyl sulfiminium chloride is prepared in high yield and purity by reacting chloramine with dialkyl sulfide under special conditions to avoid formation of dialkyl sulfilimine which is unstable. Embodiments of this invention are (A) the use of specific solvents, (B) the use of carbon dioxide as an acidic buffer, and (C) both (A) and (B) together.

3,654,360
N-BENZOYL-2-AMINOMETHYLCYCLO-HEXANOL
Gabor Bernath and Kalman Kovacs, Szeged, and Eva Palosi, Peter Gorog and Laszlo Szporny, Budapest, Hungary, assignors to Richter Gedeon Vegyezeti Gyar Rt.
No Drawing. Filed Sept. 10, 1968, Ser. No. 758,682
Claims priority, application Hungary, Sept. 11, 1967, RI-328
Int. Cl. C07c *103/38*
U.S. Cl. 260—558 R **3 Claims**

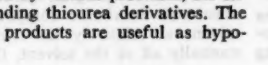
The invention concerns N-cycloalkylmethyl carboxylic amides which may be used in the treatment of epilepsy in view of their marked sedative action on the CNS.

3,654,361
TRIS(DIFLUORAMINO) ACETAMIDE
Douglas H. Dybvig, St. Paul, and Robert J. Koshar, Lincoln Township, Washington County, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
No Drawing. Filed Aug. 30, 1965, Ser. No. 484,788
Int. Cl. C07c *103/18*
U.S. Cl. 260—561 A **2 Claims**

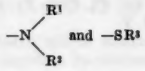
1. Tris(difluoramino)acetamide.

3,654,362
S-(3,4,4-TRIFLUORO-3-BUTENYL) N-SUBSTITUTED ISOTHIOUREA COMPOUNDS AND THEIR UTILITY
Mervin E. Brokke, Richmond, and Thomas B. Williamson, Santa Clara, Calif., and George E. Lukes, deceased, late of El Cerrito, Calif., by Wayne C. Jaeschke, special administrator, Walnut Creek, Calif., assignors to Stauffer Chemical Company, New York, N.Y.
No Drawing. Application May 27, 1968, Ser. No. 735,495, now Patent No. 3,510,503, dated May 5, 1970, which is a continuation-in-part of application Ser. No. 491,508, Sept. 27, 1965. Divided and this application Dec. 18, 1969, Ser. No. 888,113
Int. Cl. C07c *119/00*
U.S. Cl. 260—564 E **2 Claims**

Compounds of the formula



wherein X is a member selected from the group consisting of oxygen, sulfur, imino, phenylimino, chlorophenylimino, alkylimino containing from 1 to 8 carbon atoms, inclusive, and alkenylimino containing 2 to 4 carbon atoms, inclusive, R is selected from the group



wherein R^1 and R^2, individually, are selected from the group consisting of hydrogen, alkyl containing from 1 to 10 carbon atoms, inclusive, hydroxyalkyl containing from 1 to 4 carbon atoms, inclusive, alkenyl containing from 2 to 4 carbon atoms, inclusive, cycloalkyl containing from 4 to 6 carbon atoms, inclusive, phenyl, and R^1 and R^2 jointly are a divalent alkylene radical containing 4 to 6 carbon atoms, inclusive, and R^3 is selected from the group lower alkyl, chlorophenyl lower alkyl, and 3,4,4-trifluoro-3-butenyl. The above compounds are effective herbicides and nematocides.

3,654,363

PROCESS OF MONO- AND DI-NITRATING p-PHENYLENE DIAMINE COMPOUNDS

Franz J. Pum, Stamford, Conn., and Richard W. Schnetzinger, New Rochelle, N.Y., assignors to Revlon, Inc.

No Drawing. Filed Oct. 9, 1969, Ser. No. 865,190

Int. Cl. C07c *87/54*

U.S. Cl. 260—577 **6 Claims**

2-nitro- and 2,6-dinitro-N_1,N_4-dialkyl - p - phenylenediamines are obtained by nitrating an N_1,N_4-diacyl-N_1,N_4-dialkyl-p-phenylenediamine with a mixture of sulfuric acid and fuming nitric acid at about 35–80° C. (preferably 47–52° C.) and removing the acyl groups by treatment with alcoholic HCl. These compounds are useful intermediates in the preparation N_1,N_4-trisubstituted nitro or dinitro-p-phenylenediamines which are useful hair dyes.

3,654,364

BIS-(CHLORO-NITRO PHENOXY)-DIALKYL-KETONES

Walter Meckel, Dusseldorf, and Klaus König, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Nov. 6, 1969, Ser. No. 874,684

Claims priority, application Germany, Nov. 15, 1968, P 18 09 172.0

Int. Cl. C07c *93/14*

U.S. Cl. 260—571 **2 Claims**

Novel aromatic diamines containing ether groups and having chlorine atoms in the o-position to the amino groups are useful to prepare polyurethane elastomers therefrom with an organic diisocyanate and an organic compound containing at least two hydroxyl groups and having a molecular weight of from about 800 to about 5000.

3,654,365

PROCESS FOR THE PREPARATION OF PARA-AMINOPHENOL

Henri Daunis, Vienne, and Philippe Perras, Lyon, France, assignors to Rhone-Poulenc S.A., Paris, France

No Drawing. Filed Jan. 29, 1969, Ser. No. 795,052

Claims priority, application France, Jan. 30, 1968, 138,001

Int. Cl. C07c *91/44*

U.S. Cl. 260—575 **11 Claims**

para-Aminophenol is made in good yield by hydrogenation of nitrobenzene in the presence of a strong acid and a platinum catalyst at a hydrogen pressure above one atmosphere.

3,654,366

PREPARATION OF 3,6-DIAMINOPSEUDOCUMENE

Joseph Green, London, and Stanley G. Brooks, Epsom Downs, England, assignors to Vitamins Limited, London, England

No Drawing. Filed July 17, 1968, Ser. No. 745,367

Claims priority, application Great Britain, Aug. 2, 1967, 35,546/67; Apr. 18, 1968, 18,296/68

Int. Cl. C07c *85/00, 85/10*

U.S. Cl. 260—580 **7 Claims**

3,6-diaminopseudocumene and acid addition salts thereof are prepared by suspending 3,6-dinitro-5-halogenopseudocumene in an aqueous medium and thereafter reacting it with hydrogen in the presence of a hydrogenation catalyst. 2,3,5-trimethylquinol is also produced from pseudocumene by producing 3,6-diaminopseudocumene as an intermediate according to the above process and oxidizing and reducing it to produce the desired 2,3,5-trimethylquinol.

3,654,367

USE OF STANNANE AS A REDUCING AGENT IN THE REDUCTION OF NITRO COMPOUNDS TO AMINES

Gerald H. Reifenberg, Hightstown, and William J. Considine, Somerset, N.J., assignors to M & T Chemicals Inc., New York, N.Y.

No Drawing. Filed July 3, 1968, Ser. No. 742,164

Int. Cl. C07c *1/26, 29/14, 85/10*

U.S. Cl. 260—580 **4 Claims**

The method of this invention for reducing organic substrates (organic nitro compounds) comprises reacting as reactants stannate, SnH_4, and an organic substrate (organic nitro compounds), maintaining said reactants together in a reaction mixture, and separating said reduced substrate (amines) from said reaction mixture.

3,654,368

N,N-DIALKYL-α-AMINOACETYLENE THIOETHERS

Heinz G. Viehe, Linkebeek, and Serge V. Delavarenne, Wemmel, Belgium, assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 624,135, Mar. 20, 1967. This application Feb. 24, 1970, Ser. No. 14,719

Int. Cl. C07c *87/06, 149/24*

U.S. Cl. 260—583 EE **3 Claims**

N,N-disubstituted α-aminoacetylene thioethers (ynamine thioethers) are prepared by the reaction of N,N-disubstituted alkali amides and dihalovinylthioethers. The thioethers are useful as water accepting agents in condensation reactions.

3,654,369

FLUORINATION PROCESS FOR PREPARING CERTAIN DIFLUORAMINO COMPOUNDS

Donald L. Esmay, Coon Rapids, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Continuation-in-part of application Ser. No. 531,629, Feb. 21, 1966. This application Sept. 11, 1967, Ser. No. 668,293

Int. Cl. C07c *87/22*

U.S. Cl. 260—583 NH **8 Claims**

Fluorination process especially adapted for the production of highly fluorinated oxidant compounds comprising the steps of forming an adduct between ammonia and a substituted fluorimino compound in solution in an inert solvent at relatively low temperatures, removing substantially all of the solvent, then adding to the reaction

mixture an inert fluorocarbon solvent, followed by direct fluorination by contacting the adduct-solvent mixture with fluorine at a temperature less than 0° C. The process produces improved yields in larger scale reactions.

3,654,370

PROCESS FOR PREPARING POLYOXYALKYLENE POLYAMINES

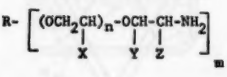
Ernest L. Yeakey, Austin, Tex., assignor to Jefferson Chemical Company, Inc., Houston, Tex.

No Drawing. Continuation-in-part of application Ser. No. 602,167, Dec. 16, 1966. This application Aug. 28, 1970, Ser. No. 67,970

Int. Cl. C07c *85/06*

U.S. Cl. 260—584 B **8 Claims**

Polyoxyalkylene polyamines having the formula:



are prepared by treating the corresponding polyoxyalkylene polyols with ammonia and hydrogen over a catalyst prepared by the reduction of a mixture of the oxides of nickel, copper and chromium. These polyamines are useful as curing agents for epoxy resins, as plasticizers, as cross-linking agents or binders for textiles and as an intermediates in the preparation of polyureas. The polyoxyalkylene polyols may be obtained by the addition of one or more alkylene oxides to an aliphatic polyhydric alcohol.

3,654,371

PROCESS FOR THE MANUFACTURE OF CYCLODEC-5-EN-1-ONE

Albert Schnider, Domat-Ems, Grisons, and Werner Hurschler, Chur Grisons, Switzerland, assignors to Inventa A.G. fur Forschung und Patentverwertung, Zurich, Switzerland

No Drawing. Filed Sept. 6, 1967, Ser. No. 665,744

Claims priority, application Switzerland, Sept. 8, 1966, 12,969/66

Int. Cl. C07c *49/44*

U.S. Cl. 260—586 A **6 Claims**

A process for the dehydration of cyclodecanol-(6)-one(1) to cyclodec-5-en-1-one. The dehydration is carried out with a catalyst system consisting of gaseous ammonia and a special, activated calcium sulfate.

3,654,372

1,1-BIS(TRIFLUOROMETHYL)-2-(TRIPHENYLPHOSPHORANYLIDENE)ETHYLENE

Gail H. Birum, Kirkwood, Mo., and Clifford N. Matthews, Wilmette, Ill., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of application Ser. No. 605,592, Dec. 29, 1966, now Patent No. 3,488,408. This application Dec. 29, 1969, Ser. No. 888,890

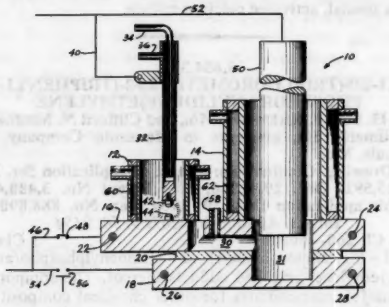
Int. Cl. A01n *9/36*; C07f *9/50, 9/54*

U.S. Cl. 260—606.5 P **3 Claims**

1,1 - bis(trifluoromethyl) - 2 - (triphenylphosphoranylidene)ethylene, and acid adducts thereof. The compounds are useful intermediates for other chemical compositions and they can also be used as pest controlling agents, textile auxiliaries, additives for petroleum products, means for flame proofing polymers, ion exchangers and the like.

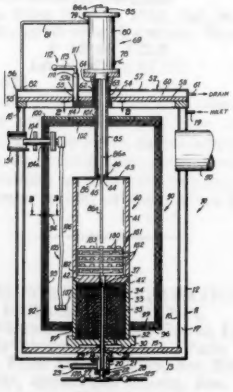
ELECTRICAL

3,654,373
APPARATUS FOR INITIATING THE HEAT GENERATION PHASE OF AN ELECTROSLAG REFINING PROCESS
Dennis E. Savor, Hixson, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.
Filed Dec. 10, 1970, Ser. No. 96,837
Int. Cl. H05b *3/60*
U.S. Cl. 13—9 **1 Claim**



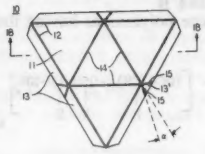
Apparatus for initiating the electroslag refining process including a slag melting mold and a metal refining mold, a passageway joining the lower portion of the two molds, and means for introducing inert gas into the passageway.

3,654,374
APPARATUS FOR AND METHOD OF DE-WAXING, PRESINTERING AND SINTERING POWDERED METAL COMPACTS
Gerard Scheyer, Morris Plains, N.J., assignor to Adamas Carbide Corporation, Kenilworth, N.J.
Filed July 25, 1969, Ser. No. 844,972
Int. Cl. F28b *7/06, 11/02*
U.S. Cl. 13—31 **19 Claims**



In this apparatus a de-waxing operation is performed in hydrogen, and the same vessel is used for vacuum sintering without moving of the part to be heat treated, and in one continuous operation.

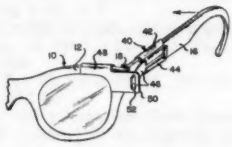
3,654,375
STRUCTURAL UNIT AND ASSEMBLY
John H. Geiger, 57 North Maple Ave., Basking Ridge, N.J.
Filed Mar. 20, 1970, Ser. No. 21,231
Int. Cl. A63h *33/04*
U.S. Cl. 35—72 **5 Claims**



A pliable structural unit which is combinable with other similar units to form a geometric assembly with multiple faces contributed by the various units.

Each unit is formed from a sheet of pliable material marked to indicate how it can be folded to serve as a single polygonal face of an assembly, or provide a multiplicity of faces. The marking is illustratively made by score lines which delimit and appear on the faces of the units and tabs. Such lines facilitate the desired folds, indicate removable material on the tabs, and limit the degree of transverse bulge for units forming single faces. The tabs permit fastening to similar tabs of other units. Fastening may take place using ordinary adhesives and standard fasteners such as paper clips.

3,654,376
PRESSURE MEANS FOR USE WITH EYEGLASS FRAMES
Thomas J. Lyons, Sr., 152 Home St., Pittsburgh, Pa.
Filed Apr. 15, 1969, Ser. No. 816,220
Int. Cl. G02c *5/16*
U.S. Cl. 351—113 **6 Claims**

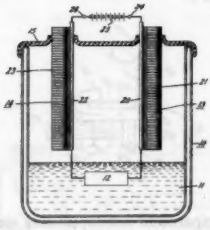


Pressure means for use with eyeglass frames, including a main support body which snugly fits over the temple portion of the frame, and an elongated spring member held by the support body and shaped to engage the end piece of the frame front when the temple is substantially fully open such that the spring is placed in tension and a pressure is exerted on the temple to urge it towards its closed position.

3,654,377
ELECTRICAL LEADS FOR CRYOGENIC DEVICES
Robert B. Fleming, Scotia, and Carl H. Rosner, Schenectady, both of N.Y., assignors to General Electric Company
Filed Dec. 15, 1969, Ser. No. 885,225
Int. Cl. H01b *7/34*
U.S. Cl. 174—15 **6 Claims**

Heat which is conducted into the cryogenic environment of a cryogenic liquid or gas along an electrical lead of a

device immersed therein is shunted into a stack of perforated plates, each spaced from adjacent plates by insulating separators, and each of which is conductively connected by a



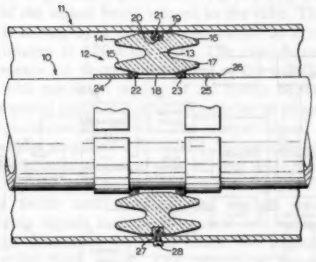
respective tap to the lead. Vapor evaporated from the bath is passed through the plates which absorb the heat that would otherwise pass through the lead into the bath, thereby reducing the boil-off of liquid from the bath.

3,654,378

BUS DUCT ASSEMBLY

Robert H. Rehder, Peterborough, Ontario, Canada, assignor to Canadian General Electric Company Limited, Toronto, Ontario, Canada

Filed Mar. 12, 1971, Ser. No. 123,668
Int. Cl. H01b 9/04
U.S. Cl. 174—16 B **4 Claims**



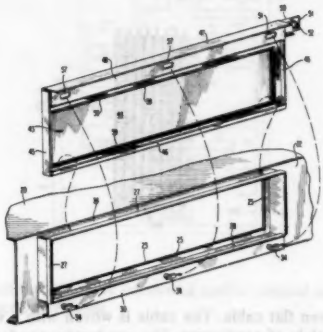
In isolated phase bus duct, a circular bus bar is supported coaxially inside a circular housing by means of a number of annular insulators spaced along the length of the bus inside the housing. Each insulator is in the form of a collar having a mid ring portion with annular skirts on both ends. The insulator surrounds the bus and extends radially outward from it to the housing. An elastomeric ring surrounds the bus at either end of the insulator and is compressed lightly between the bus and the inner sloping surface of the inner skirt on the insulator by means of a number of tabs secured to the bus. The outer periphery of the insulator has an annular groove which contains an elastomeric ring compressed lightly between the insulator and the housing. These rings cushion the assembly and allow the bus to move towards its position of zero forces from short circuit currents. This reduces the short circuit stresses imposed on the assembly.

3,654,379

SECURITY CLOSURE FOR ELECTRICALLY SHIELDED CABLE RACEWAY

Donald Howard Rodgers, Smithsburg, Md., assignor to The Danzer Metal Works Co., Inc., Hagerstown, Md.

Filed Oct. 22, 1970, Ser. No. 82,972
Int. Cl. H05k 9/00
U.S. Cl. 174—35 GC **11 Claims**



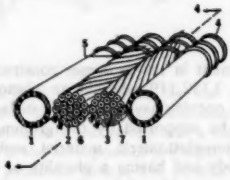
A shielded raceway duct is provided in one wall thereof with an access opening surrounded by an adapter collar having a shielding gasket abutment flange. A cover unit has interlocking hinged engagement with the collar and contains an RF energy tight gasket engageable with said flange of the adapter. The adapter carries a side extension which supports spaced quick release fasteners and the cover carries an overlying housing extension having openings to receive the heads of the fasteners. A locking member slidable within the housing extension of the cover is shiftable between positions where the fastener heads are exposed for manipulation and where they are covered and rendered inaccessible. The locking member is securely lockable to the cover in the fastener covering position.

3,654,380

WOVEN CABLE WITH OPPOSITELY-TWISTED CONDUCTOR GROUPS AND FLUID TUBES

Odes D. Tatum, and Edgar A. Ross, both of Greenville, S.C., assignors to Southern Weaving Company, Greenville, S.C.

Filed Sept. 1, 1970, Ser. No. 68,612
Int. Cl. F16l 11/12; H01b 7/08, 11/02
U.S. Cl. 174—47 **10 Claims**



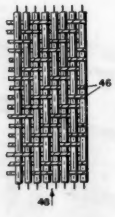
A woven cable including two bundles of twisted insulated wires. The wires in the two bundles are twisted in opposite directions. The bundles are bound together in side-by-side relationship by means of warp and weft threads. Two hollow flexible plastic tubes are bound together with the wire bundles in order to form a cable which carries both electrical signals and fluids for use in fluid-pressure controlled systems. The reverse twisting of the wires in the bundles prevents the cable from curling or becoming distorted into other undesirable shapes.

3,654,381

WOVEN FLAT CONDUCTOR

Albert R. Copp, Hudson, Mass., assignor to Surprenant, Inc., Jaffrey, N.H.

Filed June 26, 1970, Ser. No. 50,227
Int. Cl. H01b 7/08
U.S. Cl. 174—117 F 7 Claims



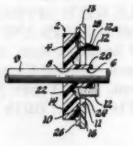
A woven flat cable. The cable is woven with a warp consisting solely of conductors. The conductors are fed through a warp feeding unit to be woven on a shuttle, needle or other loom under constant tension. Each cable may comprise diverse conductors, may be woven differently and may be printed after it is woven.

3,654,382

GROMMET CONSTRUCTION

Phillip L. Rubright, Berkley, Mich., assignor to Arco Industries Corporation, Detroit, Mich.

Filed June 1, 1970, Ser. No. 42,331
Int. Cl. F16l 5/00; H01b 17/26
U.S. Cl. 174—153 G 8 Claims



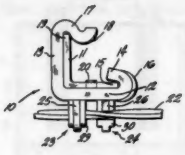
An improvement in the grommet construction shown in U.S. Pat. No. 3,182,119 wherein an elastomeric body is formed with an opening having a sealing surface for engaging a member to be supported by the grommet with a base member of non-elastomeric material embedded in the elastomeric body and having a plurality of integral fingers projecting from one side of the elastomeric body for retaining the grommet on a panel having an opening to be sealed by the grommet. In the improvement, each of the fingers has a resilient locking tang struck therefrom which extends outwardly from the respective finger and projects away from the outer end of the respective finger toward the elastomeric body, the tang being resiliently deflectable toward its respective finger when the finger is inserted in a panel opening until the free end clears the opening and snaps into engagement with the opposite side of the panel from the elastomeric body to secure the grommet to the panel and hold the elastomeric body in sealing engagement with the panel.

3,654,383

SELF-SUPPORTING ELECTRIC FENCE POST INSULATOR

Robert M. Wilson, Battle Creek, Mich., assignor to Dare Products, Incorporated, Battle Creek, Mich.

Filed June 4, 1970, Ser. No. 43,468
Int. Cl. H01b 17/16; A01k 3/00
U.S. Cl. 174—163 F 11 Claims



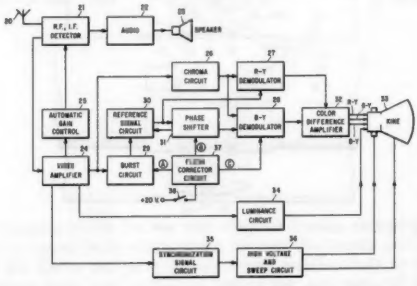
An integral wraparound self-supporting electric fence post insulator is provided integrally molded of an electrically insulating material. The insulator is provided with integral hooks or clamps for attaching to the face edges of a fence post as, for example, a fence post having either an angle-shaped or T-shaped cross-section. An outer face of the insulator is provided with a pair of laterally spaced apart hooks, one having its jaw disposed upwardly and the other having its jaw disposed downwardly. The insulator may be readily mounted on a fence post by engaging its hooks or clamp edges around the free edges of the fence post. A fence wire which is to be electrically charged is then placed in the channel defined by the two hooks, where it will be permanently retained in a condition insulated from the fence post.

3,654,384

APPARATUS FOR MODIFYING ELECTRICAL SIGNALS

John M. Kresock, Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.

Filed May 25, 1970, Ser. No. 40,239
Int. Cl. H04n 9/12
U.S. Cl. 178—5.4 HE 13 Claims



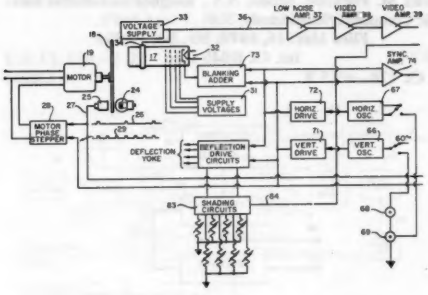
A circuit for color television which demodulates the chroma signal along two demodulator axes, that improvement where one demodulation axis is given a predetermined added lead angle and the second demodulation axis is given a predetermined added lag angle so that their separation is greater. Also in the improvement, the gain of the one demodulator is made relatively substantially less than the gain of the second demodulator. By changing the relative phase separation of the two demodulation axes and changing the relative gains of the two demodulators, colors demodulated from the chroma signal will be shifted, in the flesh range, toward a predetermined flesh color thereby providing desired flesh tone over a wide variety of transmitting conditions. The adjustments may also be made to the transmitting equipment to obtain the desired above advantage.

3,654,385

COLOR TELEVISION SYSTEM

Harry David Flagle, Studio City, Calif., assignor to Video West, Inc., Beverly Hills, Calif.

Filed July 7, 1969, Ser. No. 839,175
Int. Cl. H04n 9/34
U.S. Cl. 178—5.4 SY **7 Claims**



A color television system employing a camera tube with a rotating disc or drum serving to filter the light impinging on the tube to sequentially provide red, green and blue images or fields of the object being viewed to the tube. The rotating member is driven by a synchronous motor at a rate which provides images at 120 c.p.s. rate. The camera tube circuit includes means for decreasing the lag of the tube whereby it operates with minimum mixing of the colors between fields. A motor control keeps the rotating member in phase with the vertical synchronizing pulses. The output signal from the camera tube is amplified and applied to separate circuits for independently adjusting the gain of the color field signals produced by the camera. The signals are gated to provide sequential fields and synchronizing signals added. The synchronizing signals include horizontal and vertical pulses and a high frequency burst to mark the beginning of a selected color field signal. The composite signal can be recorded and reproduced by a conventional black and white television recorder. A switching and control circuit serves to control the tri-color tube of a conventional receiver to sequentially display the color fields at a 40 c.p.s. rate. Persistence of vision melds or blends the fields to give the effect of a color image. The receiver may be used to receive conventional NTSC color signals.

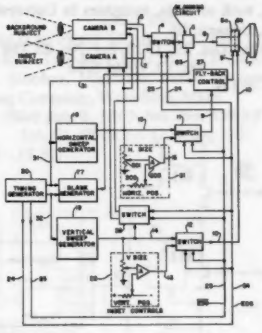
3,654,386

DUAL RASTER TELEVISION SYSTEM

Matthew C. Baum, Washington Township, Westwood County, N.J., assignor to Farrand Optical Co., Inc., Bronx, N.Y.

Filed Apr. 6, 1970, Ser. No. 26,035
Int. Cl. H04n 5/100
U.S. Cl. 178—6 **4 Claims**

A television system includes one or more cameras generating signals of non-identical scenes on successive fields of a scanning pattern including line interlace. The video signals from these fields are presented over non-coincident but partially overlapping areas of a kinescope screen by means of scanning signals synchronized with those of the video signal



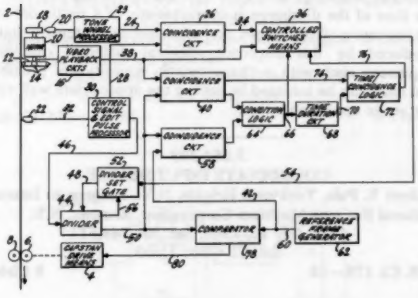
generation but of unlike horizontal and/or vertical amplitude on the successive fields.

3,654,387

VIDEO TAPE RECORDER SYNCHRONIZING SYSTEM

Kenneth Louth, Auburn, Calif., assignor to RCA Corporation, New York, N.Y.

Filed June 23, 1969, Ser. No. 835,396
Claims priority, application Great Britain, Mar. 21, 1969, 14,947/69
Int. Cl. G11b 15/28, 15/52; H04n 5/78
U.S. Cl. 178—6.6 P **7 Claims**

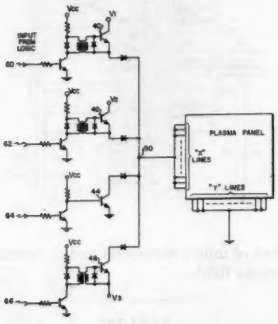


There is disclosed a technique for use in a recorder-reproducer system to provide synchronization between video information playback of the system and a local video information source. In the arrangement provided, a synchronizing signal which is produced from a first control track signal of the system, is phase compared with a reference signal from the local source. The first control track signal is one which can have one of many phase relationships with respect to the reference signal, only one of which is the desired one. A second signal from the control track and a signal extracted from the video signal are recovered from the record medium. Both of these signals can provide information as to the desired phase relation between the synchronizing signal and the reference signal. Means are provided for examining the recovered signals, for selecting the one that best defines at that time the desired phase relationship and for utilizing that signal to control the production of the synchronizing signal.

3,654,388
METHODS AND APPARATUS FOR OBTAINING VARIABLE INTENSITY AND MULTISTABLE STATES IN A PLASMA PANEL

Hiram Gene Slottow, Maumee, and William Dooley Petty, Perrysburg, both of Ohio, assignors to University of Illinois Foundation, Urbana, Ill.

Filed Oct. 29, 1970, Ser. No. 85,160
Int. Cl. H04n *5/66*
U.S. Cl. 178—7.3 D **11 Claims**

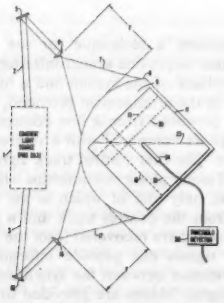


Techniques for providing multiple states and variable intensity in a gaseous discharge device known in the art as "plasma panel" or "plasma display panel." A method and apparatus for imparting information to a plasma display panel to produce an image of several intensity levels, and the preserving of this image on the panel until new information is received by the panel. The information that controls the intensity at a given cell is imparted in the form of a voltage but at a selected time creates a control discharge at the selected cell. The discharge creates a wall voltage at the cell that at the time of the discharge is characteristic of a particular stable sequence of discharges, and of an average intensity that is produced by this sequence. Several different discharge sequences each with a characteristic intensity are possible, and each can be initiated by setting the appropriate wall voltage at the appropriate time.

3,654,389
COORDINATE INPUT DEVICE

Robert V. Pole, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed July 12, 1968, Ser. No. 744,511
Int. Cl. G08c *21/00*
U.S. Cl. 178—18 **8 Claims**

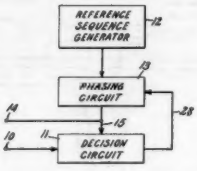


A coordinate input device having two beams of pulsed laser light passing through a photochromic glass plate. The successive intersection points of pulses from the two beams scan the plate along a raster to successively mark each coordinate position on the plate. A light pen directs ultraviolet light onto the surface of the plate to generate a scattering center at any chosen coordinate on the plate. Laser light is scattered by such centers and is detected by the light pen. The greater amount of light scattered at an intersection point is used to generate an indication of the chosen coordinate. Another embodiment uses roughened glass, rather than photochromic glass, to cause scattering.

3,654,390
SYNCHRONIZER FOR SEQUENCE GENERATORS

Charles M. Puckette, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 16, 1970, Ser. No. 19,904
Int. Cl. H04b *1/16*
U.S. Cl. 178—69.5 R **6 Claims**

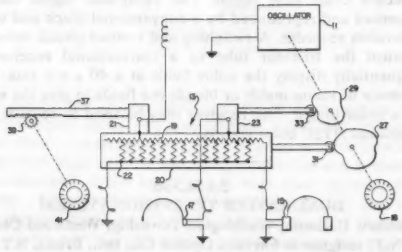


A synchronizer for two maximum length sequence generators is disclosed wherein a digital, time varying filter is used to compare the two sequences. The generator used to generate one of the sequences is modified by the output of the filter to change the sequence generated thereby. When the output of the filter indicates a predetermined, minimum amount of disagreement between the two sequences, the modification of said one of the sequence generators is terminated and the two sequences are synchronized to a predetermined degree. The amount of disagreement allowed may be tailored to suit conditions under which the synchronizer must operate.

3,654,391
AUDIOMETER ATTENUATOR

Lawrence B. Arguimbau, Lancaster, and Rufus L. Grason, Lincoln, both of Mass., assignors to Grason-Stadley Company, Inc., West Concord, Mass.

Filed Mar. 24, 1970, Ser. No. 22,359
Int. Cl. H04r *29/00*
U.S. Cl. 179—1 N **9 Claims**



In the audiometer attenuator disclosed herein, an attenuating resistance array and a pair of taps co-operating with the array are arranged so that both the taps and the array are movable. In this way a variety of relative attenuation adjustments may be provided between a signal source and two

transducers attenuators having different frequency response characteristics. In particular, movement of the resistance array itself provides for frequency compensation for one of the transducers while movement of one of the taps provides for frequency compensation for the other transducer. Movement of the other tap provides an independent attenuation adjustment which is indicative of hearing loss independently of which transducer is employed.

3,654,392

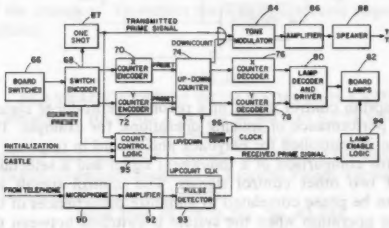
ELECTRONIC GAME BOARD SYSTEM

Gilbert D. Beinhocker, Cambridge, Mass., and John S. Galinato, Pacoima, Calif., assignors to Gilbert D. Beinhocker, Belmont, Mass.

Filed Apr. 7, 1970, Ser. No. 26,365

Int. Cl. H04m *11/06*

U.S. Cl. 179—2 DP **15 Claims**



An automated electronic system for the remote communication and display of chess or other board game moves in real time via a voice-grade telephone line. Each player has an electronic console which includes a chess board operative to provide unique indication of each of the 64 squares of the board and means for sending and receiving coded representations of each move.

3,654,393

DATA TRANSMISSION SYSTEM

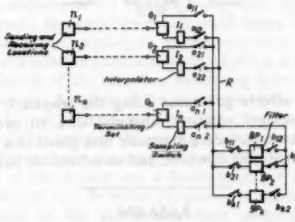
Dieter Schenkel, Ay/Iller, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt, Germany

Filed Feb. 26, 1970, Ser. No. 14,332

Claims priority, application Germany, Feb. 27, 1969, P 19 09 906.0

Int. Cl. H04j *3/00*

U.S. Cl. 179—15 A **15 Claims**



A data transmission system between two parties or locations wherein switches are provided for each of the locations which are cyclically closed for short periods of time to provide for the galvanic connection between the locations. The data, which is scanned with respect to its amplitude without prior filtering, i.e., over its full bandwidth, and then transmitted in time multiplex, is generated with a fundamental frequency band width which is greater than one-half the scanning frequency. The transmitted scanned data is filtered by means of a band pass filter to suppress periodically occurring regions which contain the distortions resulting from the grouping of the fundamental bands about the multiples of the scanning frequency.

3,654,394

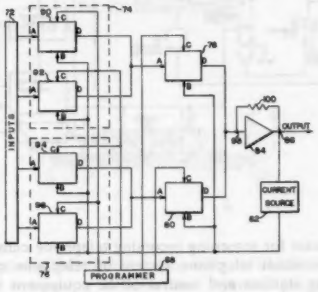
FIELD EFFECT TRANSISTOR SWITCH, PARTICULARLY FOR MULTIPLEXING

Bernard M. Gordon, Magnolia, Mass., assignor to Gordon Engineering Company, Wakefield, Mass.

Filed July 8, 1969, Ser. No. 839,937

Int. Cl. H03k *17/62;* **H04j** *3/00*

U.S. Cl. 179—15 BL **11 Claims**



In a device for multiplexing plural analog signals, a high impedance switch, wherein the conduction state of a first field effect transistor is controlled by a second field effect transistor, is provided for expeditious switching of an input signal and minimal loading of an input source.

3,654,395

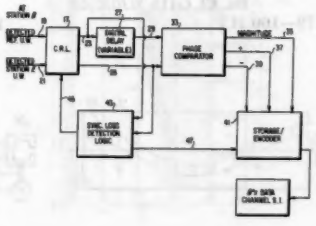
SYNCHRONIZATION OF TDMA SPACE DIVISION SATELLITE SYSTEM

William George Schmidt, Rockville, Md., assignor to Communications Satellite Corporation

Filed Oct. 15, 1969, Ser. No. 866,659

Int. Cl. H04j *3/06*

U.S. Cl. 179—15 BS **6 Claims**



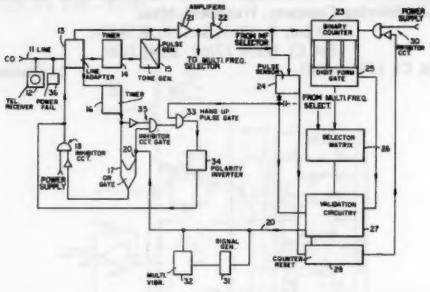
Method and apparatus for synchronizing signals transmitted by a first group of earth stations via a communications satellite to a second group of earth stations is provided. The communications satellite utilizes spot beam transmitting antennas which are positioned such that earth stations are unable to monitor their own transmit signals. One earth station in each group of stations receives all signals from the other group of earth stations, performs appropriate synchronization computations, and retransmits synchronizing information to said other group of stations.

3,654,396

TELEPHONE SCREENING SYSTEM

Nicolaas Biezeveld, 17 Coronet Ave., Mill Valley, Calif.

Filed Oct. 24, 1969, Ser. No. 869,209
Int. Cl. H04m *3/38*
U.S. Cl. 179—18 D **10 Claims**



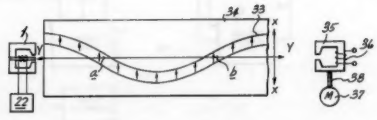
A system for screening incoming telephone calls for use in a conventional telephone system of telephone calling and receiving stations and central office equipment in which a line adapter receives at a telephone station, signals initiated by a calling station and establishes a communication path between the telephone receiving station and calling station. Logic circuitry for receiving and processing additional signals initiated by the calling station identifies such additional signals, compares the additional signals with a program code for validation, and actuates an indicator if the additional signals are validated.

3,654,397

SYSTEM FOR PRODUCING AN ELECTRICAL OUTPUT SIGNAL IN CORRESPONDENCE WITH A MAGNETIC RECORDING

Saburo Uemura, Kanagawa, and Yoshitaka Hashimoto, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 20, 1970, Ser. No. 21,285
Claims priority, application Japan, Apr. 9, 1969, 44/27844
Int. Cl. G11b *5/30, 5/08*
U.S. Cl. 179—100.2CF **15 Claims**



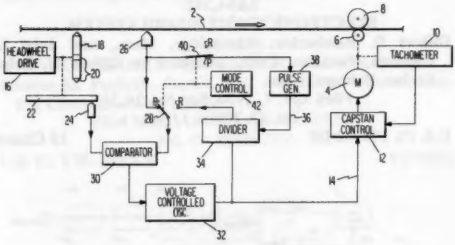
In a magnetic field detecting system having a dual-gap, magnetic flux responsive head and a magnetic flux generating source magnetized in directions across the gaps of the head, the source and head are moved relative to each other in a direction at right angles to the direction of magnetization, and such magnetization has a pattern that varies along the source considered in the direction of relative movement so that the output of the head may provide a signal of any desired wavelength limited only by the magnetization pattern.

3,654,398

DEVICE TO KEEP A CAPSTAN IN PHASE WHEN SWITCHING MODES

Kenneth Louth, Menlo Park, Calif., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 3, 1970, Ser. No. 25,467
Int. Cl. G11b *27/08*
U.S. Cl. 179—100.2 B **5 Claims**



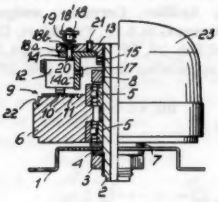
A capstan control useful in a recorder reproducer system in the performance of splicing operations, for example. The capstan is controlled for playback and record in response to the error comparison of a tonewheel signal and a selectable one of two other control signals. The control signals are made to be phase correlated to minimize disturbances of the capstan operation when the system is switched between the playback and record modes.

3,654,399

SOUND EFFECT GENERATOR WITH ROTATING MAGNETIC DISK

Sergio Montanari, Via Irnerio 22, Bologna, Italy

Filed May 8, 1970, Ser. No. 35,678
Int. Cl. G10h *3/04*; G11b *5/82*
U.S. Cl. 179—100.2 A **2 Claims**



A sound effects generator using the playback of signals from an enclosed rotating magnetic disk to produce the sound. Features include a magnetic disk glued to a ventilated groove on a rotating flywheel, and an adjustable head.

3,654,400

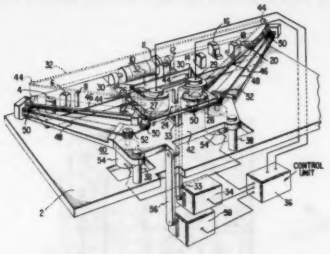
WEB HANDLING APPARATUS

Bernard L. Dickens, Cherry Hill; Leonard J. Kudla, Haddon Heights; Arch C. Luther, Jr., and Bruno F. Melchionni, both of Cherry Hill, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 17, 1969, Ser. No. 807,839
Int. Cl. G11b *15/66, 23/10*
U.S. Cl. 179—100.2 T **9 Claims**

Apparatus for automatically disposing a record web for operation by the transport of a recorder-reproducer system. The web is first formed into a given shape which approxi-

mates the shape of the operating path defined by the transport elements. The web is then interlaced with the elements



of the transport. To retract the web, the reverse sequence is utilized.

3,654,401

PLAYBACK SYSTEM WITH RADIATION GUIDE MEMBER HAVING A SLIDE PORTION EXTENDING INTO THE GROOVE

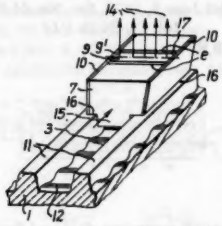
Gerhard Dickopp; Helmut Batsch, and Eduard Schuller, all of Berlin, Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt, Germany

Filed May 28, 1970, Ser. No. 41,281

Claims priority, application Germany, May 29, 1969, P 19 27 408.9

Int. Cl. G11b *3/34; H04r 23/00*

U.S. Cl. 179—100.41L **19 Claims**



An improved system for reproducing signals stored on a recording medium in the form of undulations corresponding to the signals, the undulations generally being formed as a spiral groove. The undulations on the recording medium are moved past a suitable radiation source, such as a light source, and the density of the radiation emanating from the undulations, which is a function of the curvature of the undulation, is detected by a suitable radiation detecting means after it passes through a suitable slit aperture arranged at a predetermined distance from the recording medium surface so that variations in the density are a function of the undulations. The undulations may be either frequency or phase modulated with respect to the signal and their amplitude can be modified as a function of their recorded wavelength in such a manner that the curved surface portions of the undulations have nearly the same focal length for all occurring wavelengths.

The tracking of the playback system is improved by providing a radiation guide member which slides along the raised portions of the surface of the recording medium and has a slide member which extends into the particular groove or portion thereof being scanned. Formed within the guide member is an element which is optically effective for the type of radiation utilized to collect the emanating radiation and aids in its evaluation. This element may be either the slit aperture itself or a collecting lens which directs the emanating radiation to the slit aperture.

3,654,402

TRANSDUCER FOR CONVERTING ACOUSTIC VIBRATIONS INTO ELECTRICAL OSCILLATIONS, AND VICE VERSA, IN THE FORM OF A DIAPHRAGM COATED WITH AT LEAST ONE LAYER OF A PIEZO-ELECTRIC MATERIAL

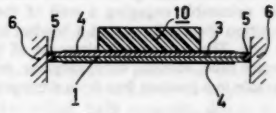
Jan Roos, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 25, 1969, Ser. No. 861,028

Claims priority, application Netherlands, Sept. 30, 1968, 6813996

Int. Cl. H04r *17/02*

U.S. Cl. 179—110 A **3 Claims**



A microphone that includes a housing in which a flexible diaphragm comprising at least one layer of piezoelectric material is secured by means of a resilient ring surrounding the periphery of the diaphragm. A flat disc composed of an acoustic damping material is mounted directly on the center of the diaphragm by means of an adhesive substance.

3,654,403

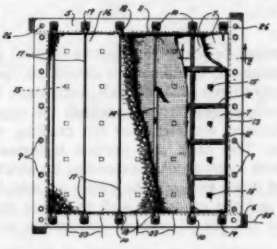
ELECTROSTATIC SPEAKER

Lloyd J. Bobb, deceased, Glenside, Pa., assignor to Chester C. Pond, Doylestown, Pa. and Lucy M. Bobb, executrix, part interest to each

Filed May 1, 1969, Ser. No. 820,888

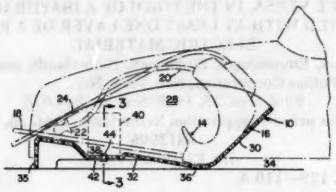
Int. Cl. H04r *19/02*

U.S. Cl. 179—111 R **6 Claims**



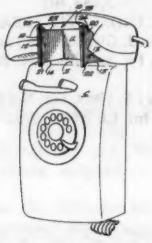
An electrostatic speaker incorporating one and preferably two flexible membranes each with a conductive coating, mounted in a frame comprising clamping surfaces for engaging the membranes and electrical contact means and for maintaining the membranes under tension, with one or more perforated backing plates in spaced position adjacent each membrane but mounted independently of the clamping engagement of the frame with the membranes, and with acoustically transparent spongy cellular damping slabs in pressure engagement with the backing plates.

3,654,404
HEADSET CRADLE
Kenneth J. Hutchings, Soquel, Calif., assignor to Pacific Plantronics, Inc., Santa Cruz, Calif.
Filed Apr. 1, 1970, Ser. No. 24,496
Int. Cl. H04m *1/06*
U.S. Cl. 179—146 R **5 Claims**



A cradle for supporting and positioning a communications headset on a telephone housing. The cradle includes a spring metal clip for releasably engaging a wall of the telephone housing to position the cradle so that a headset is safely held when not in use. The component elements of the headset, such as the voice tube, acoustic tube, earpiece, and cable are held by the cradle in a position free from damage and soiling.

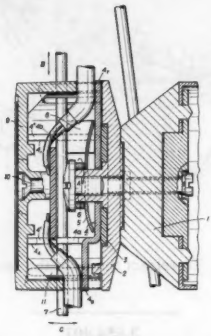
3,654,405
HANDSET REST ATTACHMENT DEVICE FOR WALL TELEPHONES
Marvin M. Hanson, and Jose Baltar, both of 4152 E. 10th Ln., Hialeah, Fla.
Filed June 12, 1970, Ser. No. 45,610
Int. Cl. H04m *1/04*
U.S. Cl. 179—146 **5 Claims**



An attachment device for resting the handset portion of a wall-hung telephone equipment is described, comprising a unitary structure having a back wall portion and two spaced-apart, forwardly-extending wall portions the upper edges of which are formed with recesses for cradling the handset therebetween. The back wall portion is formed along its lower edge with a downwardly-extending lip which is adapted to be pressed down between the wall-hung telephone equipment cover and the mounting wall to secure the device in place without the use of cement, attachment screws or the like.

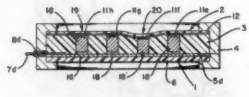
3,654,406
DEVICE FOR ADJUSTABLY MOUNTING A MICROPHONE ON A HEADSET
Karl Reinthaler, Wien, Austria, assignor to AKG Akustische U. Kino-Gerate Gesellschaft m.b.H., Vienna, Austria
Filed Nov. 5, 1970, Ser. No. 87,243
Claims priority, application Austria, Nov. 7, 1969, 10504/69
Int. Cl. H04m *1/05*
U.S. Cl. 179—152 **7 Claims**

A U-shaped supporting pedestal is rotatably and frictionally secured at its bight portion to a support member attached to the earphone of a headset. The limbs of the pedestal extend outwardly from the support member and are slotted to receive an elongated microphone arm which is longitudinally displaceable through the slots. Further, the arm



can be positioned by rotating the pedestal on the support member and by laterally displacing the arm within the slot in one limb while it is held in frictional engagement within the slot in the other limb.

3,654,407
COMPRESSION SWITCH
Theodore S. Kepner, Sunnyvale, and Michael F. Miller, Los Altos, both of Calif., assignors to Sylvania Electric Products Inc., Mountain View, Calif.
Filed June 8, 1970, Ser. No. 44,218
Int. Cl. H01h *3/14*
U.S. Cl. 200—86 R **1 Claim**

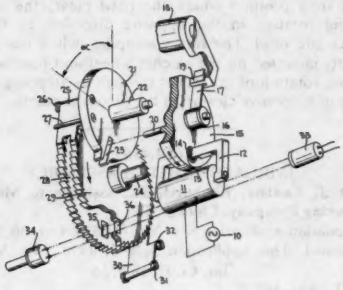


This matrix switch comprises rigid and flexible printed circuit boards oriented such that separated sets of parallel strip conductors on the boards extend transversely of each other, i.e., in a grid pattern. The boards are stacked such that the conductors of each set are spaced apart by a sponge rubber pad having an aperture therethrough at each crossover point on the grid of conductors. Each aperture contains a conductive element with a height less than that of the pad and having convexly curved surfaces adjacent the conductors. The switch is closed by manual pressure on the flexible board at a selected crossover point to compress the pad until the crossed conductors engage the aligned element and close the switch at that point.

3,654,408
DIFFERENTIAL-MOTION TIMER
James M. Meek, 1600 Atwood Road, Silver Spring, Md.
Filed Apr. 30, 1970, Ser. No. 33,457
Int. Cl. H01h *43/18*
U.S. Cl. 200—33 R **11 Claims**

A differential-motion timer. Reciprocating motion of a predetermined frequency and angular displacement is converted into unidirectional rotary motion by means of at least two ratchet wheels coaxially aligned and independently freewheeling and each having a different number of notches. Each of the ratchet wheels is driven by a ratchet drive which

is connected to the reciprocating element. Accordingly, each ratchet wheel can convert reciprocating motion to unidirectional rotary motion, the speed of the rotary motion being, on the average, proportional to the driver frequency. Since each of the ratchet wheels has a different number of notches, it follows that each of the wheels will be driven at a



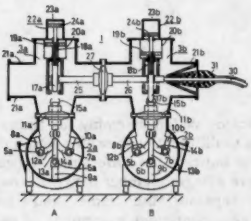
slightly different speed by the single ratchet driver. This difference speed is the timing motion and the relative angular positions of the wheels correspond to the elapsed time. A switch is actuated whenever certain preselected corresponding points on each of the ratchet wheels arrive at predetermined positions.

3,654,409

METAL-CLAD HIGH VOLTAGE CIRCUIT BREAKER APPARATUS

Claus Kessler, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Nov. 9, 1970, Ser. No. 87,834
Claims priority, application Germany, Nov. 14, 1969, P 19 58 837.5
Int. Cl. H01h *31/00*
U.S. Cl. 200—48 R **9 Claims**



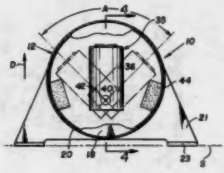
An output line has two branches, each of which is provided with a corresponding circuit breaker. The high voltage circuit breaker apparatus is housed in a metal covered housing which is divided into a plurality of areas which are provided with an insulating medium of higher grade than air at atmospheric pressure. Each of the circuit breakers is in direct electrical contact with a corresponding one of the bus bars and with the other circuit breaker. The circuit breakers are separated from each other by a partition in the housing and each bus bar is separated from the corresponding circuit breaker by a partition in the housing. The output line is electrically connected directly to a circuit breaker.

3,654,410

PIVOTED INERTIA SWITCH SELF-ORIENTING ALONG A LINE OF DECELERATION IN A PRESCRIBED ANGULAR PATTERN

James R. Miller, Huntington, N.Y., assignor to Aerodyne Controls Corporation, Farmingdale, N.Y.

Filed Dec. 8, 1970, Ser. No. 96,108
Int. Cl. H01h *35/14*
U.S. Cl. 200—61.45 R **10 Claims**



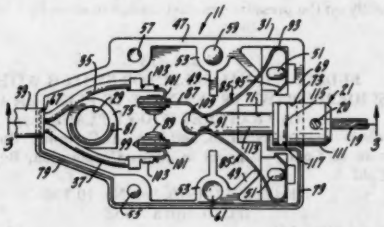
An inertia switch assembly includes a support in the form of a casing in which an inertia switch body is mounted for free swinging in an angular pattern so that the switch body aligns itself with the direction of an applied force. Inertia means in the switch body responds slower to the applied force than the switch body. The inertia means include a conductive member which contacts terminal pins pivotally supporting the switch body.

3,654,411

BREAK-AWAY SWITCH

Joseph F. Wohnlich, Warren, and Donald L. Endsley, Marion, both of Ind., assignors to United Filtration Corporation, Chicago, Ill.

Filed Nov. 23, 1970, Ser. No. 91,941
Int. Cl. H01h *27/04*
U.S. Cl. 200—61.19 **3 Claims**

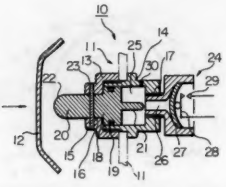


A break-away safety switch suitable for installation in the electrical system of a trailer for use in completing an electrical circuit to apply the brakes of the vehicle or to actuate an alarm. The switch is contained in a compact waterproof housing of low silhouette which is pivotally mounted on a trailer. The housing is formed of a pair of identical half sections of plastic which are fused together along a longitudinal mating periphery to seal the housing and thereby prevent corrosion of the electrical switch parts located therein. The wiring and break-away plunger enter the housing through openings located in the opposite ends thereof. The plunger is equipped with an O-ring to seal its opening into the housing. The electrical contacts of the switch are mounted on individual springs which are biased towards each other and held apart by the plunger.

3,654,412
MOTOR VEHICLE PRESSURE ACTUATED DEFORMATION RESPONSIVE SWITCH WITH PISTON ACTUATOR AND VENT OPENING

Takashi Haruna, Yokosuka, and Hitoshi Sato, Yokohama, both of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Feb. 10, 1971, Ser. No. 122,881
Int. Cl. H01h *35/34, 35/14;* **B60r** *27/00*
U.S. Cl. 200—832 **6 Claims**

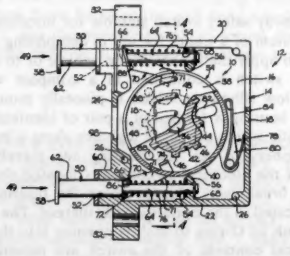


A trigger switch mechanism adapted to actuate motor vehicle safety devices in response to deformation of a particular portion of the vehicle body resulting from a collision of the motor vehicle with an obstruction. The mechanism comprises a cylinder mounted inside the particular portion of the vehicle body. A slidable piston is mounted within the cylinder and has a rod integrally formed therein. The rod extends axially from the piston and terminates at a suitable distance from the particular portion of the vehicle body. Deformation of the particular portion of the vehicle body exerts a force on the piston tending to move it in one direction. A shear pin is provided in the cylinder to prevent such piston movement until the force exceeds a predetermined magnitude. A pressure-sensitive switch is provided to close a circuit leading to the safety devices when the pressure within the cylinder chamber exceeds a predetermined level caused by the movement of the piston. A vent opening is provided in the cylinder so that the pressure within the same cannot exceed the predetermined level in the event of only a slight collision. The piston has another rod extending axially from the piston in the other direction. When the displacement of the piston exceeds a predetermined magnitude, the rod acts directly on the pressure-sensitive switch to close it.

3,654,413
BI-DIRECTIONAL SELECTOR SWITCH WITH SLIDABLE PAWL TRANSVERSE TO PLUNGER AXIS AND RATCHET WHEEL PLANE

Lewis W. Jordan, Newhall, and Leon A. Cerniway, Burbank, both of Calif., assignors to Janco Corporation, Burbank, Calif.

Filed Feb. 12, 1970, Ser. No. 10,738
Int. Cl. H01h *13/58*
U.S. Cl. 200—156 **11 Claims**

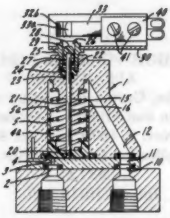


A bi-directional rotary ratchet mechanism and rotary stepping switch embodying the mechanism. The ratchet mechanism has a pair of actuating plungers straddling a ratchet wheel and each rockably mounting a spring-loaded wheel actuator or pawl which rotates under spring action into driving engagement with the ratchet wheel to step the latter in one direction of rotation upon movement of the respective plunger through a wheel driving stroke. During the return stroke of the plunger to its normal position, the pawl engages an interior surface of the ratchet housing which rotates the pawl outwardly away from the ratchet wheel against spring action to a position where the pawl clears the wheel for stepping rotation in the opposite direction by the other plunger and pawl. The rotary stepping switch has electrical contacts mounted on the ratchet wheel and housing so that stepping rotation of the wheel through its stepping positions results in successive closure of the switch contacts.

3,654,414
INDICATOR SWITCH ASSEMBLY

Walter J. Kudlaty, Elmhurst, Ill., assignor to Marvel Engineering Company, Chicago, Ill.

Continuation application Ser. No. 771,924, Oct. 30, 1968, now abandoned. This application July 7, 1970, Ser. No. 56,151
Int. Cl. H01h *9/16*
U.S. Cl. 200—167 R **2 Claims**



An indicator switch assembly for filters wherein a piston responsive to differential pressures within the filter housing is movable to indicate the differential between said pressures and to move a finger member between a pair of closed switch arms to separate the same and break the circuit therebetween, continued movement of said finger member being effective to close at least one of said switch arms with a third switch arm to create a circuit therebetween.

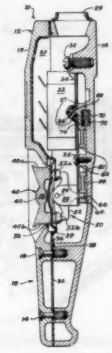
3,654,415
PENDANT HOIST CONTROL DEVICE

Harold V. Hawkins; Ralph A. Dick, both of Williamsville, N.Y., and Edgar A. Bongort, Southfield, Mich., assignors to Columbus McKinnon Corporation, Tonawanda, N.Y.

Filed Sept. 24, 1970, Ser. No. 75,087
Int. Cl. H01h *9/06, 9/04*
U.S. Cl. 200—168 G **9 Claims**

The hoist control features a casing of pistol grip like construction, which serves to enclose electrical switches, and an externally mounted rocker operator for controlling operation

of the switches. Rocker movement is transmitted to the switches through a moisture sealing diaphragm and a switch



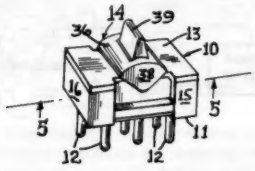
actuating means arranged within the casing for movement in response to rocker induced movement of the diaphragm.

3,654,416

SEALED TILT SWITCH

Walter L. Cherry, and Michael F. Bedocs, both of Highland Park, Ill., assignors to Cherry Electrical Products Corporation, Highland Park, Ill.

Filed Oct. 23, 1970, Ser. No. 83,498
Int. Cl. H01h 9/04
U.S. Cl. 200—168 G 9 Claims



A sealed switch housing including an external tiltable switch actuating member adapted to be operatively connected to an internal switch actuator, with the actuating member and actuator arranged upon a cover utilized to close and seal a switch components compartment. Means are provided whereby the cover is positionable in sealing relation upon the peripheral edges of the compartment after the external actuating member and internal actuator are connected together to either side of the cover, with the cover and compartment providing complementary elements that form rotatable bearing seats for bearing members provided by the internal switch actuator.

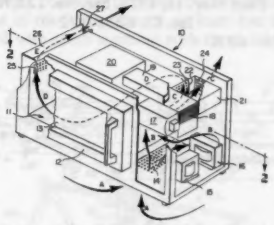
3,654,417

MICROWAVE OVEN INCLUDING AIR FLOW SYSTEM

Wallace R. Javes, and Vernon E. Cassibo, both of Minneapolis, Minn., assignors to Litton Precision Products, Inc., Beverly Hills, Calif.

Filed Oct. 30, 1970, Ser. No. 85,539
Int. Cl. H05b 9/06
U.S. Cl. 219—10.55 3 Claims

An improved air flow system for a microwave oven which includes blower means for providing a heated air flow, a portion of this heated air flow is directed into the cavity of a microwave oven by duct means. Filter means is located on the air exhaust end of the cavity, such filter means having a reservoir to collect condensation so that a large volume of



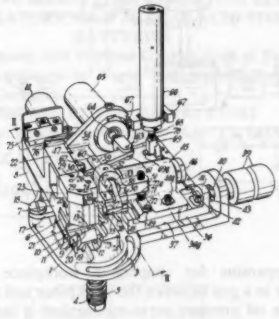
condensation-laden air is not exhausted from the microwave oven at any one time.

3,654,418

METHOD AND APPARATUS FOR THE MANUFACTURE OF WIRE RINGS

John Wyatt Meacher, Gerrards Cross, and David Stanley Pile, Garston, both of England, assignors to The Westminster Engineering Company Limited, Harrow, Middlesex, England

Filed Apr. 13, 1970, Ser. No. 27,805
Claims priority, application Great Britain, Apr. 18, 1969, 19,839/69
Int. Cl. B23k 11/00
U.S. Cl. 219—56 9 Claims



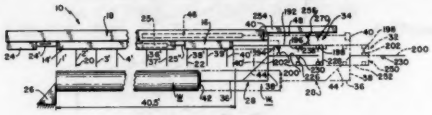
The invention relates to a method and apparatus for the manufacture of wire rings. The Specification discloses a method of manufacturing a wire ring by feeding a length of wire past a first welding electrode and forming said wire to take up a ring shape with a free end having its axis displaced from the axis of the section of said wire passing said first welding electrode. The free end of the wire is clamped to a second welding electrode, the wire passing the first welding electrode is clamped to that electrode and the wire is cut between the electrodes. Relative movement of the electrodes then takes place to bring the free end and the cut end of the wire together with their axes substantially aligned and the free end and the cut end are then butt welded together. This method may be performed by a butt welding attachment designed for fitting to existing wire ring forming machines or a wire ring forming machine may be built to include necessary welding apparatus. The invention enables wire rings to be formed without the need for a handling operation between the ring forming and the welding steps.

3,654,419

TRACK WELDING APPARATUS

Hugo H. Ovando, Napa, Calif., assignor to Kaiser Steel Corporation, Oakland, Calif.

Filed Mar. 10, 1971, Ser. No. 122,789
Int. Cl. B23k 9/12
U.S. Cl. 219—60 R 12 Claims



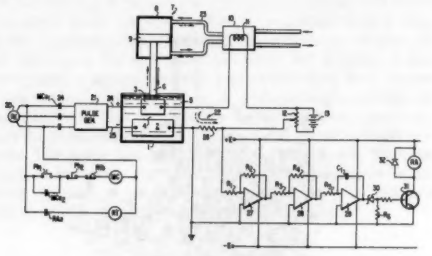
Improved adjustable fixture for pipe tack welding apparatus whereby the apparatus can tack weld a pipe section that has a length greater than the length of the apparatus itself by simple adjustment of a fixture together with a sensing device for controlling adjustment of the fixture.

3,654,420

APPARATUS FOR SHAPING A WORKPIECE BY ELECTRICAL DISCHARGE WITH DETECTION MEANS FOR STOPPING THE SHAPING OPERATION UNDER ABNORMAL CONDITIONS

Nagao Saito; Yoichi Kuji, and Sinji Arai, all of Nagoya, Japan, assignors to Mitsubishi Electric Corporation, Tokyo, Japan

Filed Aug. 14, 1970, Ser. No. 63,760
Int. Cl. B23p 1/08, 1/14
U.S. Cl. 219—69 S 7 Claims



An apparatus for shaping a workpiece by electrical discharge in a gap between the workpiece and a shaping electrode. An oil pressure servo-mechanism is used to maintain the gap at a constant value. The shaping process takes place within a tank filled with an inflammable liquid. Under abnormal conditions, an undesirable deposit, such as carbon, may form and build up on the workpiece surface and thereby cause the electrode to move away from the workpiece during a shaping process instead of closer thereto. Means, such as a mechanical switching arrangement or electrical circuitry, are provided for detecting time delay the abnormal condition and for enabling the shaping operation to thereby be stopped.

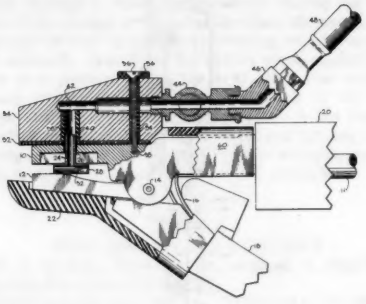
3,654,421

GOUGER ATTACHMENT FOR CONVENTIONAL ELECTRODE HOLDER

Foy J. Streetman, P.O. Box 395, Plains, Tex., and John D. Armitstead, 2232 Auburn, Space 19, Lubbock, Tex.

Filed Sept. 22, 1970, Ser. No. 74,401
Int. Cl. B23k 9/32
U.S. Cl. 219—70 8 Claims

An attachment is provided for a conventional electrical welding electrode holder. The attachment substitutes a nozzle for the conventional electrode tooth member so that compressed air is blown along the electrode to blow away molten metal. The attachment converts a standard electrode holder to a gouging device.

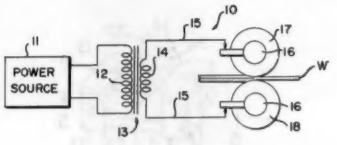


3,654,422

SQUARE WAVE RESISTANCE WELDING

Paul M. Erlandson, Palos Park, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed July 26, 1966, Ser. No. 568,022
Int. Cl. B23k 11/06
U.S. Cl. 219—81 2 Claims



A method and apparatus for resistance welding of lapped workpieces using square wave power, wherein the power to the weld is supplied in the form of controlled bursts of waveforms through opposed welding electrodes.

3,654,423

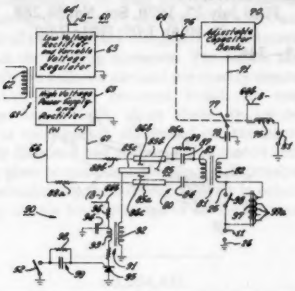
PERCUSSIVE WELDER

Delbert L. Phillips, 4 Malibu Cove Colony, Malibu, Calif., and Lewis Clark Feightner, 19800 Lassen St., Chatsworth, Calif.

Original application Mar. 25, 1968, Ser. No. 715,773. Divided and this application June 1, 1970, Ser. No. 54,074
Int. Cl. B23k 9/22, 9/06; H05b 31/30
U.S. Cl. 219—95 5 Claims

One of two small workpieces that are to be welded together is slidingly mounted in a fixed workholder and the other is firmly gripped by a movable workholder. To carry out an operating cycle, the movable workholder is reciprocated by two lobes of a cam that makes one revolution when momentarily connected to a relatively large mass that rotates at constant velocity. Initially the first slidable workpiece is placed at random at a position that is advanced slightly from the position desired for the welding operation but the first reciprocation of the second workpiece is against the slidable workpiece to retract it precisely to the desired position for a welding operation. In carrying out the second reciprocation, the two workpieces are charged by

capacitance and as the gap between the two workpieces narrows a high frequency pulse triggers an arc between the two



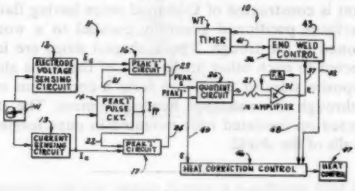
workpieces and the continued advance of the second workpiece crowds the two workpieces together for final fusion.

3,654,424

QUOTIENT CIRCUIT

Peter W. Vanderhelst, Livonia, Mich., assignor to Robotron Corporation, Detroit, Mich.

Division of Ser. No. 650,714, July 3, 1967, Pat. No. 3,573,421
Filed Mar. 23, 1970, Ser. No. 24,928
Int. Cl. B23k *11/24*
U.S. Cl. 219—110 11 Claims



A resistance drop feedback welding control circuit is disclosed which includes apparatus for detecting the effective instantaneous resistance across the welding position of a resistance welding machine from the electrode voltage and welding current. A method of detecting the effective instantaneous resistance from the electrode voltage and welding current is also disclosed. Means are provided for producing pulses in concurrence with peaks of the welding current waveform. Further means controlled by these pulses sample the electrode voltage and welding current at the welding current peaks. A quotient circuit produces a high frequency pulse train in which the pulse amplitude is proportional to the peak electrode voltage amplitude and the pulse duration is inversely proportional to the peak amplitude of the welding current. The quotient circuit includes means for averaging the amplitude of the high frequency pulse train to provide a d.c. output portional in magnitude to the contact resistance at the welding position.

3,654,425

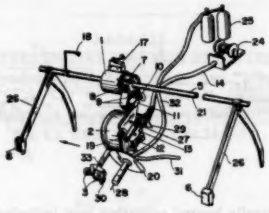
AUTOMATIC WELDING APPARATUS WITH PATH FOLLOWER

Hirokazu Nomura; Michio Mimura, and Yoshiyuki Ono, all of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed June 9, 1970, Ser. No. 45,092
Claims priority, application Japan, Sept. 29, 1969, 44/92038
Int. Cl. B23k *9/12*
U.S. Cl. 219—125 PL 11 Claims

An automatic welding apparatus wherein a relatively small portable assembly can be situated at a selected location for efficiently carrying out relatively light welding operations. A single elongated rail supports a carriage for movement parallel to the path which is to receive the weld, and this rail is received in bores of supporting leg structures. The rail has teeth, and one of the leg structures, at least, has a swingable lever provided with teeth meshing with those of the rail for releasably locking the latter and the supporting leg structure with respect thereto.

The carriage has adjustably fixed thereto a bracket which slidably supports a structure which carries a welding unit, a wire feeder for feeding welding wire to the unit, and guide rollers for guiding the unit along the path as the carriage is driven along the rail.

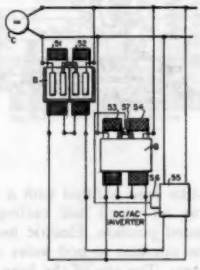


3,654,426

METHOD AND MEANS FOR PREHEATING ELECTRIC ACCUMULATORS SUCH AS LEAD-ACID STORAGE BATTERIES

Jurgen Brinkmann, and Wieland Gehrke, both of Berenbostel, Germany, assignors to Varta Aktiengesellschaft, Frankfurt/Main, Germany

Filed Apr. 13, 1970, Ser. No. 27,752
Claims priority, application Germany, Apr. 12, 1969, P 19 18 726.9
Int. Cl. H05b *1/00*
U.S. Cl. 219—209 22 Claims

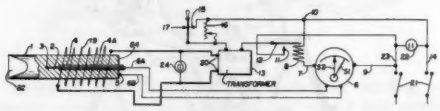


Storage batteries, particularly those of the lead-acid type, are preheated electrically by subjecting the electrode plates of the battery to an inductive alternating field which induces electric current in the plates. The frequency of the inductive field preferably is within the range from about 250 Hz. to 1,500 Hz. The intensity of the field is reduced or the heating field is terminated upon a sufficient rise in plate temperature.

3,654,427
ELECTRIC HEATED SOLDERING TOOL

Alexander Schoenwald, 142 Harvard St. Rear, Grove City, Pa.

Continuation-in-part of application Ser. No. 672,847, Oct. 4, 1967, now abandoned. This application Sept. 28, 1970, Ser. No. 75,879
Int. Cl. H05b 3/02; B23k 1/02; H01h 47/26
U.S. Cl. 219—241 2 Claims

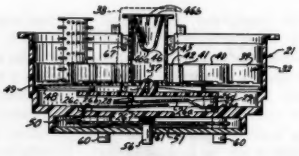


An electrically heated soldering iron includes an electrical heating coil surrounding a heating element core. A metal soldering iron tip has screw threads formed on its rear end portion for releasably attaching the tip to the heating element core in heat transfer relationship. An elongated metal rod of a different metal than the tip has an end portion thereof received in a bore formed in the rear end portion of the tip. An electrical conductor is secured to the tip in spaced relationship to the rod. Both the rod and conductor extend axially rearward from the tip and make electrical contact with electrical connections within a hollow handle attached to the heating element core. The tip defines the only connection between the rod and the electrical conductor so that the tip itself forms a part of a thermocouple with the rod and electrical conductor.

3,654,428
APPARATUS FOR HEATING AND CONDITIONING HAIR CURLING ROLLERS

Henry J. Talge, Kansas City, Mo.; Samuel L. McNair, Shawnee Mission, and Marvin W. Litman, Prairie Village, both of Kans., assignors to The Songrand Corporation

Filed May 25, 1970, Ser. No. 40,219
Int. Cl. H05b 3/60; A45d 4/06
U.S. Cl. 219—288 12 Claims

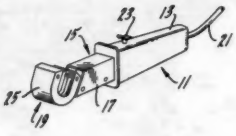


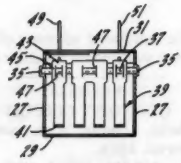
A circular pan-like base is fitted with a rotatable imperforate support tray on which hair curling rollers can be deposited in upended position. Electric heat means at the bottom of the base operates to boil water causing steam to arise around the tray. The top of the base is covered by a hinged cover having an inside pattern of radial striations for collecting and guiding condensate back toward the periphery of the unit where it can drain by gravity back into the water below the tray. A dispensing chamber for hair conditioning composition is located on the tray and the tray is provided with drain passages for carrying condensate and conditioning medium deposited on the tray to the rim for discharge into the water below. Steam venting means and liquid level control means both designed to inhibit collection of condensate on the exterior of the unit are provided.

3,654,429
HEATING ARRANGEMENT

Ronald A. Strachan, Sycamore, Ill., assignor to Ideal Industries, Inc., Sycamore, Ill.

Filed July 27, 1970, Ser. No. 58,288
Int. Cl. H05b 3/00; H01c 3/00
U.S. Cl. 219—346 3 Claims



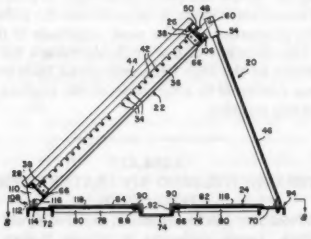


A hand tool for heat shrinking material having an elongated shield of generally U-shaped cross-section defining a trough for receiving a work piece. A resistance heater element is positioned inside the shield. The resistance heating element is constructed of U-shaped strips having flat, radiating surfaces positioned generally parallel to a work piece positioned in the trough. The U-shaped strips are integrally connected to each other at the ends of the strips alternately on opposite sides of the U's to form a continuous electrical path through the resistance heating element. The strips are supported on insulated rods mounted in cups formed in the end walls of the shield.

3,654,430
RAILROAD CAR THAWING DEVICE UTILIZING DISPOSABLE REFLECTOR SHEETS

Frank L. Thayer, Lafayette Hills, Pa., assignor to Johnson-March Corporation, Philadelphia, Pa.

Continuation of application Ser. No. 552,121, May 23, 1966, now abandoned. This application Nov. 29, 1968, Ser. No. 784,528
Int. Cl. H05b 1/00
U.S. Cl. 219—347 2 Claims



A heating device for thawing railroad cars includes a heater and an elongated support for a disposable reflective member. The heater comprises a plurality of electric heating elements disposed in substantial coplanar relationship in an elongated heater panel. The support includes at least one

planar plate which includes a supporting surface which is adjacent the panel of heating elements. The supporting plate includes means for removably securing thereto a reflective member comprised of at least one thin disposable sheet of material having a reflective surface. The sheet and supporting surface of the plate are elongated and substantially coextensive with the heating elements. The sheets act to reflect heat towards the railroad car and are readily removable when the reflective surface becomes soiled or tarnished for replacement by a fresh, clean sheet. In an embodiment designed for use beneath a railroad car the heater panel is horizontally disposed and is pivotally mounted relative to the supporting plate to provide access to the disposable sheets. In another embodiment, the supporting plate is removable from the heating device for replacement of the disposable reflective sheet.

3,654,431

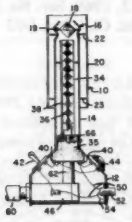
BUNSEN BURNER SIMULATING FLAMELESS ELECTRIC HEATER

David N. Brooks, West Peabody; Clyde L. Paulauskas, Beverly, both of Mass., and Ronald E. Edin, Stratham, N.H., assignors to Sylvania Electric Products Inc.

Filed Aug. 19, 1970, Ser. No. 65,190

Int. Cl. F24h *3/04*; F23d *3/40*

U.S. Cl. 219—373 **2 Claims**



A flameless electric heater having a resistance wire heater coil insulated from and positioned within a vertical tubular stack. A constant air flow is directed over the coil establishing a hot air zone at the exit point of the stack. The electric power source to the heater is controlled by a cutoff device that is actuated when the air flow drops below a predetermined pressure, thus preventing overheating and burn-out of the coil of the heater.

3,654,432

ELECTRICALLY HEATED CATALYTIC AIR PURIFIER

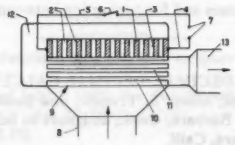
Mogens Dyre, Als Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed July 13, 1970, Ser. No. 54,486

Claims priority, application Germany, July 3, 1969, P 19 33 828.4

Int. Cl. B01j *9/20*; F24h *3/04*; F28f *13/06*

U.S. Cl. 219—374 **1 Claim**



The invention relates to air-treatment equipment for removing impurities from the air, particularly substances having an odor or taste and bacterial spores. The equipment includes a heating element, maintained at a high temperature, over which the air passes or is directed and this causes air borne particles to break down into odorless substances. The equipment includes a heat exchanger arrangement which serves to reduce the temperature of the heated air returned to the room or space from which the air was withdrawn. The heating element of the heating unit is made of electrically conducting silicon carbide having a thin coating of catalyst material.

3,654,433

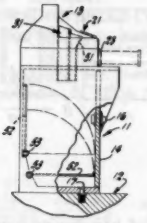
DIFFERENTIAL CHANGE REGISTER

Phyllis E. Mendoza, 208 Anza Vista Ave., San Francisco, Calif.

Filed Sept. 24, 1969, Ser. No. 860,573

Int. Cl. E05g *1/00*; G06c *29/00*

U.S. Cl. 235—7 A **7 Claims**



Apparatus for registering payment received, payment owed and indicating the change difference. The apparatus includes a locked receptacle for deposit of payments received and a change unit for payment of change difference. The change unit is openable for each transaction, while the receptacle is of the vault type adapted for permanent attachment to the floor or the like and which cannot be opened by a cashier operating the apparatus.

3,654,434

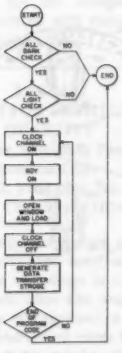
PHOTO SENSOR ARRAY CHECKING METHOD AND APPARATUS

Herbert W. Forman, Falmouth, and Everett W. Muse, Burlington, both of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Filed June 16, 1970, Ser. No. 46,715

Int. Cl. G06k *7/016*

U.S. Cl. 235—61.11 E **10 Claims**



In a mark sense card reader having photo detectors and photo amplifiers, a system for checking the operation of all

channels of the device by reading a dark, then light portion on the leading edge of a card to be read, in order to allow sensed data to be strobed from a register to an external device.

3,654,435

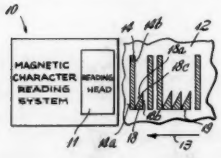
MAGNETICALLY READABLE BAR AND CODE

Angelo Vaccaro, Port Washington, N.Y., assignor to Columbia Controls Research Corporation, Glen Cove, N.Y.

Filed June 2, 1970, Ser. No. 42,738

Int. Cl. G06k *19/06*

U.S. Cl. 235—61.12 M **7 Claims**



A code formed of bars having one type of bar for one piece of information and another type of bar for another piece of information with the bars being formed of magnetizable material and in which the ratio of the amplitude of the electromagnetic wave produced by the leading edges of both types of bars being moved past a character reading system is substantially increased by slanting or inclining the leading edge of one type of bar with respect to the movement while maintaining the leading edge of the other type of bar perpendicular to the movement.

3,654,436

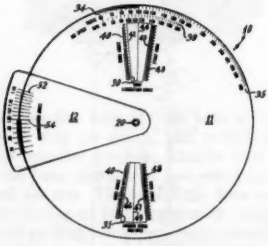
AIR NAVIGATION COMPUTER FOR WINDAGE PROBLEMS

Richard E. Sansom, Jr., 843 Alderman Road, Apt. 241, Jacksonville, Fla.

Filed Oct. 15, 1970, Ser. No. 80,954

Int. Cl. G06c *27/00*

U.S. Cl. 235—78 **11 Claims**



A computer including a pair of discs and cursor rotatably connected with a first logarithmic scale representing variations in wind speed on the lower disc and a second logarithmic scale representing variations in air speed on the upper disc. The upper disc includes a window through which is read indicia on the lower disc representing the wind correction angle solutions for each of the various combinations of the first and second logarithmic scales whereby the wind correction angle solution is indexed and read adjacent the appropriate wind angle on the scale of wind angles adjacent such window when an air speed is aligned with a wind speed. The upper member includes another window through which is read indicia on the lower disc representing the ground speed multiple solutions for each of the various combinations of the first and second logarithmic scales whereby the ground speed multiple solution is indexed and read adjacent the appropriate wind angle on the other scale of wind angles adjacent such other window when an air speed is aligned with a wind speed. The cursor includes a logarithmic scale representing variations of ground speed multiples corresponding to indicia solutions on the lower disc, the cursor scale having an index cooperating with a selected air speed on the second logarithmic scale whereby the ground speed is read on the second logarithmic scale adjacent the appropriate ground speed multiple on the cursor.

3,654,437

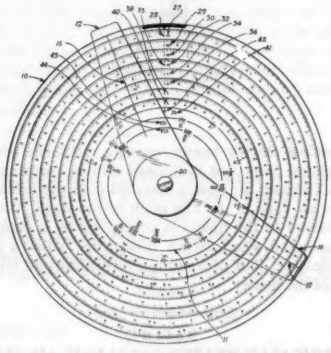
OCTAL/DECIMAL CALCULATOR

Philip J. Wyatt; Albert S. Trundle, and Judith B. Bruckner, all of Santa Barbara, Calif., assignors to Science Spectrum, Santa Barbara, Calif.

Filed July 3, 1969, Ser. No. 838,833

Int. Cl. G06g *1/02*

U.S. Cl. 235—84 **18 Claims**



A calculating device comprising a base member, a plurality of graduated scales arranged on the base member, and indicator means cooperating with the scales for performing a variety of calculations. The scales are graduated in octal base numbers and decimal base numbers for use in making conventional arithmetic and algebraic operations in both octal and decimal bases and for converting between these bases.

3,654,438

HEXADECIMAL/DECIMAL CALCULATOR

Philip J. Wyatt; Albert S. Trundle, and Judith B. Bruckner, all of Santa Barbara, Calif., assignors to Science Spectrum, Santa Barbara, Calif.

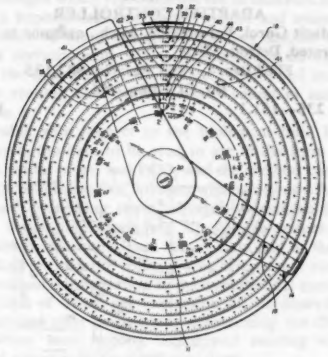
Filed July 9, 1969, Ser. No. 840,251

Int. Cl. G06g *1/02*

U.S. Cl. 235—84 **16 Claims**

A calculating device comprising a base member, a plurality of graduated scales arranged on the base member, and in-

dicator means cooperating with the scales for performing a variety of calculations. The scales are graduated in hexadecimal base numbers and decimal base numbers for use in



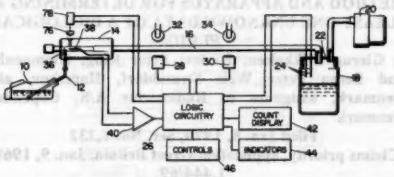
making conventional arithmetic and algebraic operations in both hexadecimal and decimal bases and for converting between these bases.

3,654,439

PARTICLE COUNTING APPARATUS HAVING AUTOMATIC DISPLAY AND THRESHOLD SETTING

Weems E. Estelle, Southport, and Pasquale M. Petrucci, Orange, both of Conn., assignors to General Science Corp., Bridgeport, Conn.

Filed Apr. 28, 1970, Ser. No. 32,583
Int. Cl. H03k *21/18*
U.S. Cl. 235—92 PC **5 Claims**



Particle counting apparatus especially adapted for blood cell counting and which is essentially automatic in operation. Coded sample flasks are employed in conjunction with a counter display to automatically set the appropriate decimal point for corresponding red or white count magnitude and to also provide automatic threshold settings for red and white cell counts.

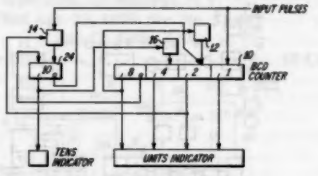
3,654,440

COUNTER

George Draper Hanchett, Summit, N.J., assignor to RCA Corporation

Filed July 7, 1970, Ser. No. 52,949
Int. Cl. H03k *21/16*
U.S. Cl. 235—92 PE **8 Claims**

Multiple stage counter for counting to a value which is less than the total number of states the stages can assume. When the desired maximum count is reached, the counter switches directly back to its minimum count. During the switching between certain counts, for example from the maximum to the minimum count, a holding circuit responsive to the previ-



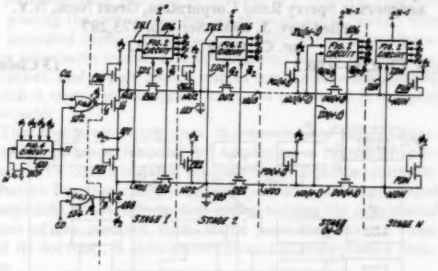
ous condition of one of the counter stages prevent another counter stage from assuming an undesired state.

3,654,441

FOUR-PHASE HIGH SPEED COUNTER

Uipalananda Bharali, Raritan, N.J., assignor to RCA Corporation

Filed Nov. 16, 1970, Ser. No. 89,600
Int. Cl. G06m *1/14*; H03k *23/08*
U.S. Cl. 235—92 LG **5 Claims**



In response to each pulse to be counted, the bit stored in each stage of the counter is sensed. In the case of up-counting, when the j least significant bits are 1 and the $j+1^{th}$ least significant bit is a 0, the stages storing these $j+1$ bits are caused concurrently to change state, and where j is any integer which is less than n, and n is the number of stages in the counter. In the case of down-counting, the same procedure is followed for the complementary case. The counter may be implemented with metal oxide semiconductor (MOS) field-effect transistors.

3,654,442

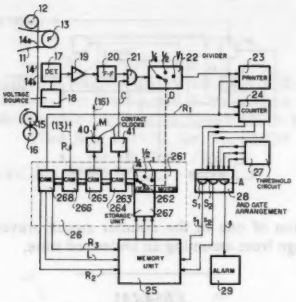
AUTOMATIC SYSTEM FOR MONITORING A PHYSICAL QUANTITY

Didier Leonard, Boulogne, and Rene Pautrat, Chelles, both of France, assignors to Thomson CSF.

Filed Jan. 22, 1968, Ser. No. 699,642
Int. Cl. G06m *11/04*
U.S. Cl. 235—92 PC **16 Claims**

System for automatically monitoring a physical quantity by periodic sampling wherein the interval between samplings and the duration of the samplings is varied according to a predetermined ratio each time the magnitude of the measured physical quantity transgresses a threshold value. A timer is provided with individual cams for periodically controlling the sampling interval and the measuring interval and a timer motor drives the cams at a controllable speed. A control arrangement having the threshold values stored therein

monitors the measured values and adjusts the speed of the timer motor by a factor k each time the measured value transgresses a threshold value, thereby adjusting both the sampling time and the measuring time of the system.

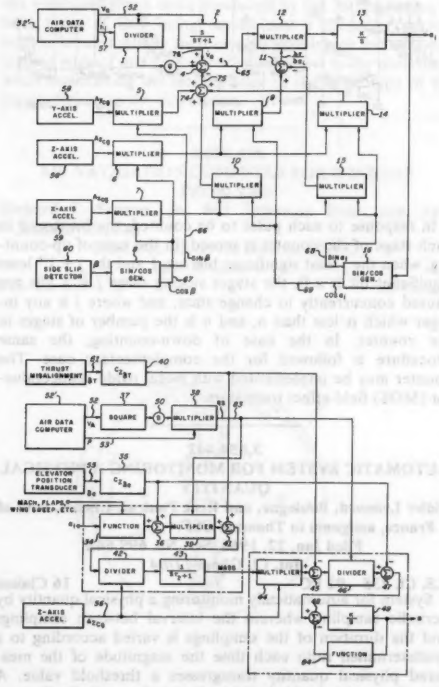


3,654,443

ANGLE-OF-ATTACK COMPUTER

Joe B. Dendy, and Kent G. Transier, both of Phoenix, Ariz., assignors to Sperry Rand Corporation, Great Neck, N.Y.

Filed Nov. 3, 1969, Ser. No. 873,287
Int. Cl. G06g 7/78, 7/32
U.S. Cl. 235—150.2 **13 Claims**



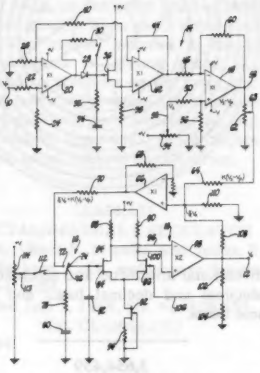
An angle-of-attack computer using closed loop computation techniques wherein various on-board sensor outputs are combined to determine a first or initial measure of angle-of-attack which is then used to derive a measure of the mass of the vehicle, which mass measure is then used to determine true airframe angle-of-attack.

3,654,444

ADAPTIVE CONTROLLER

Ismail Macit Gurol, Farmington, Mich., assignor to GSE, Incorporated, Detroit, Mich.

Filed Dec. 4, 1969, Ser. No. 882,133
Int. Cl. G06g 7/66
U.S. Cl. 235—151.1 **10 Claims**



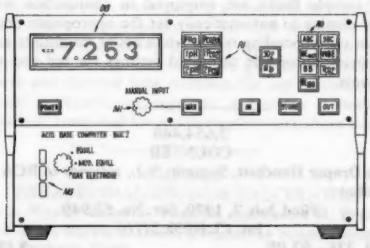
Adaptive control circuit including an input portion for deriving a discontinuous error signal representing the difference between a monitored value and a set point, means for transferring a portion of the error from one of two isolated terminal points to the other, and a multiplier for restoring the transferred signal to the untransferred level.

3,654,445

METHOD AND APPARATUS FOR DETERMINING AT LEAST ONE UNKNOWN DATA OF A BIOLOGICAL FLUID

Stig Glerup Mikkelsen, Herlev; Peter Ring, Klampenborg, and Soren Peter Weis Stranddorf, Hareskov, all of Denmark, assignors to Radiometer A/S, Copenhagen, Denmark

Filed Jan. 8, 1970, Ser. No. 1,332
Claims priority, application Great Britain, Jan. 9, 1969, 1,444/69
Int. Cl. G06g 7/32
U.S. Cl. 235—151.3 **33 Claims**



The invention relates to a method and apparatus for determining at least one unknown parameter of a biological fluid, for example a blood sample.

The apparatus comprises equipment for reading known or measured data of the biological fluid into an analog computer—either by using digital or analog values of the known data—and with the analog computer being programmed to process the read-in data to produce therefrom a plurality of variable voltages which represent curves of different configuration in a hypothetical coordinate system and memorizing the magnitude of these voltages when they assume a value equal to a corresponding point of intersection between the curves of the hypothetical coordinate system, and including means for reading out the memorized values in analog or digital form.

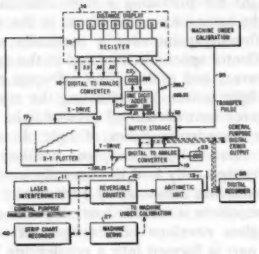
Specifically, with respect to the biological fluid being a blood sample, the data to be read in are in the form of two correlated values of pH and PCO_2 and the method comprises the steps of producing two voltages which vary as a function of time and processing these voltages to assume in time sequence values corresponding to voltage values being analog with the two correlated sets of data and at the same time building up variable voltages which represent curves of a predetermined configuration in the hypothetical coordinate system, points of which are expression of the desired, unknown data, and after comparison memorizing the different voltages when they become equal and reading out the memorized values in analog or digital form.

3,654,446

METHOD AND APPARATUS FOR THE MEASUREMENT AND DISPLAY OF ERROR VALUES OF PRECISION MACHINE TOOLS, ELECTRONIC INSTRUMENTS, ETC.

Gary B. Gordon, Cupertino, and Jonathan D. Garman, Sunnyvale, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 3, 1970, Ser. No. 25,520
Int. Cl. G06f *15/46;* **H03k** *13/02*
U.S. Cl. 235—151.3 **33 Claims**



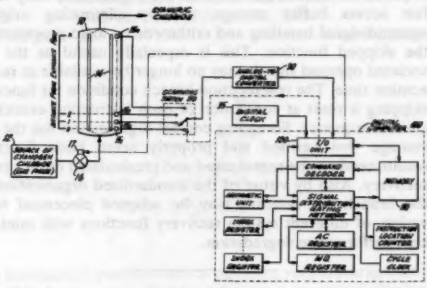
A system for measuring and plotting a sequence of error values, for example the positioning errors of machine tools as a function of distance along an axis of travel, the output frequency errors in voltage controlled oscillators, and the like is described. The system for positioning error plotting comprises a laser interferometer for measuring the actual distance of movement of the machine and a novel and simple calculator system including a pair of digital-to-analog converters coupled to the interferometer for determining from this laser interferometer measurement both the desired (or assumptive) distance of movement of the machine and the error distance between the actual distance and the desired distance. By assuming the desired position of the machine, complex interconnections to its controller are avoided. The calculated error distance and distance at which the error occurred are plotted on an X-Y recorder. A similar technique is described for the calibration of voltage controlled oscillators.

3,654,447

ELECTRONIC INSTRUMENTATION SYSTEM FOR CATALYTIC CYANOGEN CHLORIDE TRIMERIZATION

Claude G. Bradley, Baton Rough, La., assignor to Geigy Chemical Corporation, Greenburgh, N.Y.

Filed Apr. 23, 1970, Ser. No. 31,267
Int. Cl. G06g *7/58*
U.S. Cl. 235—151.12 **18 Claims**



Cyanogen chloride is trimerized to form cyanuric chloride in an exothermic reaction performed in a reaction chamber by passing the cyanogen chloride through tubes packed with an activated carbon catalyst. A plurality of spaced temperature responsive transducers are disposed within the reaction chamber, and supply analog output temperature information which is converted to digital form and registered in a digital computer.

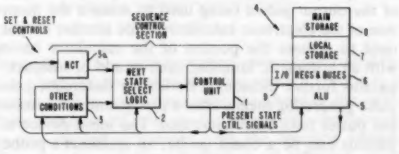
The computer determines the continuous temperature-reaction distance function by employing a regression program to fix coefficients for a predetermined temperature distribution function employing linear, square, and exponential component terms. Information characterizing the operational status of the reaction, such as the peak temperature value and its location, is determined from the temperature function.

3,654,448

INSTRUCTION EXECUTION AND RE-EXECUTION WITH IN-LINE BRANCH SEQUENCES

Donald C. Hitt, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 19, 1970, Ser. No. 47,693
Int. Cl. G06f *9/00, 11/00*
U.S. Cl. 235—153 **14 Claims**



Instruction re-execution for error recovery is enhanced by function skipping conditional branches in the execution control sequence. Branches continuing the main execution stream control execution and re-execution of basic functions and ancillary verification and saving functions required for error recovery. The latter functions are organized for rapid execution so as not to unduly lessen the execution throughput rate of the system. Ancillary functions include checking of particular basic function result signals and associated ancillary function control signals, 'scratchpad' sav-

ing of the particular function result signals in fast access general purpose buffer storage and setting of re-execution branch conditions to signal for skipping of basic functions when re-executing instructions after basic function result signals have been saved. Function skipping branches are taken therefor only in late re-execution; i.e. only when the re-execution branch condition for function skipping has been set prior to occurrence of error in execution. In the function skipping branch previously saved basic function result signals required for continued execution are obtained directly from fast access buffer storage, thereby eliminating original operand signal handling and arithmetic or logic processes of the skipped function. This is especially useful as the associated operand signals may no longer be available at re-execution time. The re-execution branch condition for function skipping is reset at conclusion of each instruction execution control sequence. Foregoing control organization has the advantage that verified and properly saved basic function results need not be reprocessed and recalculated during error recovery. Also by virtue of the standardized organization of the branch the controls may be adapted piecemeal to a variety of different system recovery functions with minimal cost/performance degradation.

3,654,449

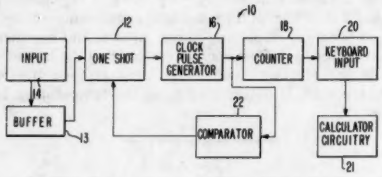
CALCULATOR INPUT MEANS TO BYPASS CONVENTIONAL KEYBOARD INPUT

Kenneth D. Boyce, Mountain View, Calif., assignor to Diversified Electronics Co., Inc., Sunnyvale, Calif.

Filed Nov. 5, 1970, Ser. No. 87,034

Int. Cl. G06f *7/48*

U.S. Cl. 235—156 **34 Claims**



Apparatus for use with a electronic calculator of the type having a keyboard input wherein the apparatus comprises means for receiving input pulses and for generating a number of output pulses for each input pulse, respectively, with one of the output pulses being used to actuate the numeral portion of the electronic calculator while another output pulse is used to actuate the portion of the calculator having to do with an arithmetic function, such as add or subtract. The apparatus further includes a device for deactuating the output pulse generating means after a predetermined number of output pulses have been generated. The input device of the apparatus can be a count probe, an architect's probe, an engineer's probe or planimeter.

3,654,450

DIGITAL SIGNAL GENERATOR SYNTHESIZER

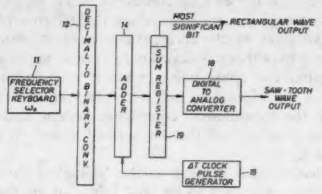
Joseph A. Webb, 503 Fairdale, Friendswood, Tex.

Filed Apr. 3, 1970, Ser. No. 25,348

Int. Cl. G06f *15/34*

U.S. Cl. 235—197 **20 Claims**

Illustrative embodiments of the present invention shown and described include digital logic systems for generating signal waveforms of desired types. A relatively few digital logic modules are connected to generate a variety of desired waveshapes in a linear manner. Apparatus for generating rectangular waves, saw-tooth waves, sine waves, and sine



waves having amplitude, pulse, frequency and phase modulation applied to them are disclosed.

3,654,451

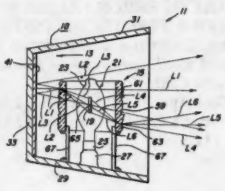
FLOODLIGHT

George N. Starr, Memphis, Tenn., assignor to American Electric Manufacturing Corporation, Southaven, Miss.

Continuation-in-part of application Ser. No. 693,220, Dec. 18, 1967, now abandoned. This application Sept. 18, 1969, Ser. No. 865,227

Int. Cl. F21p *5/00*

U.S. Cl. 240—3 **11 Claims**



A floodlight for providing a high efficiency rectangular beam of light having a narrow beam in the vertical dimension. The floodlight includes a vertically elongated light source, a reflector spaced behind and to the opposite sides of the light source, and a sleevelike refractor or Fresnel lens around the light source for refracting the rays of light from the light source into horizontal rays of light to provide the substantially rectangular beam of light. In a modified arrangement, there is provided an auxiliary reflector for reflecting the upwardly and downwardly emitted rays from the light source into substantially horizontally extending rays of light. Also, there is included an alternate embodiment in which the glass envelope of the lamp of which the light source is a part is formed into a condensing lens instead of having a separate Fresnel lens. In addition, there is included another embodiment in which the refractor is provided in the interior thereof with a plurality of vertical prisms, with a part of the prisms refracting the light rearwardly onto a reflector for reflection into a center portion of the beam pattern and with the remaining part of the prisms refracting the light to either side of the center portion of the beam pattern.

3,654,452

INSTRUMENT BOARD IN A MOTOR VEHICLE

Egon Frey, Stuttgart-Degerloch, and Horst Kaisser, Sindelfingen, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Oct. 30, 1969, Ser. No. 872,714

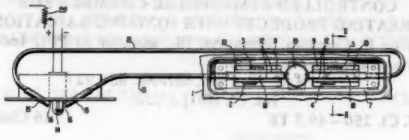
Claims priority, application Germany, Nov. 2, 1968, P 18 06 718.0

Int. Cl. B60q *3/04*

U.S. Cl. 240—8.16 **22 Claims**

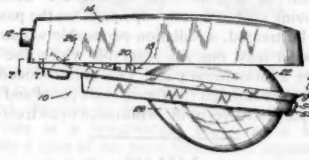
An instrument panel for a motor vehicle in or at which instruments, actuating levers, and/or actuating knobs are ar-

ranged and in which one of the instruments is adapted to be illuminated by an incandescent lamp; light-conducting cables conduct the light from the incandescent lamp to one or



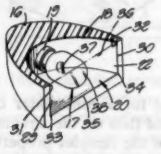
several of the other instruments, actuating levers or actuating knobs, and a light-distributing body is connected to each light-conducting cable at the remote place to be illuminated.

3,654,453
LUMINAIRE
Edward R. Jablonski, South Milwaukee, Wis., assignor to McGraw-Edison Company, Elgin, Ill.
Filed Oct. 2, 1970, Ser. No. 77,445
Int. Cl. F21s *1/10*
U.S. Cl. 240—25 **14 Claims**



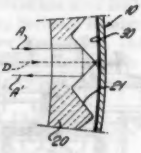
A luminaire has a deck assembly pivotally mounted on a housing by a separable connection to allow removal of the deck assembly from the luminaire. A refractor assembly is pivotally connected to the deck assembly, also by a separable connection for movement with or independent of the deck assembly. A selectively operable latch has a latched position holding the housing, deck assembly, and the refractor assembly, as a unit, an intermediate position holding the deck and refractor assemblies together but releasing them for movement relative to the housing, and an open position wherein the refractor assembly is released for movement relative to the deck assembly. A releasable connection separate from the latch is also provided between the housing and deck assembly. Selective access to all interior elements of the luminaire is thus provided.

3,654,454
LIGHTING DEVICE
Bobby G. Olesen, 12051 Skyway Drive, Santa Ana, Calif.
Filed Aug. 1, 1969, Ser. No. 846,765
Int. Cl. F21v *7/08*
U.S. Cl. 240—41.35 E **8 Claims**



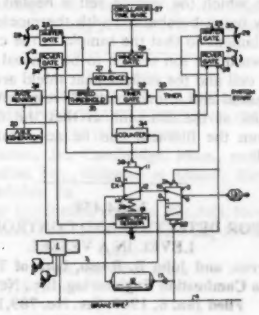
A lighting unit includes a light source and a curved reflector. The lighting unit provides a rectangular light pattern which illuminates a predetermined area with the direct light from the light source and the reflected light from the reflector.

3,654,455
LUMINAIRE
Joel Siegel, Brooklyn, N.Y., assignor to Holophane Company, Inc., New York, N.Y.
Filed Aug. 20, 1969, Ser. No. 851,671
Int. Cl. F21v *13/04, 5/00, 7/10*
U.S. Cl. 240—93 **8 Claims**



A luminaire is provided which achieves very low brightness of a ribbed prismatic reflector wall as seen at normal viewing angles by the utilization of a housing which is blackened for at least a portion thereof.

3,654,456
APPARATUS FOR CONTROLLING CAR SPEED AT COUPLING
Ronald A. Sarbach, Columbus, Ohio, assignor to Westinghouse Air Brake Company, Wilmerding, Pa.
Filed Oct. 15, 1970, Ser. No. 80,939
Int. Cl. B61l *3/00*; B61b *1/00*
U.S. Cl. 246—182 B **11 Claims**



An automatic railway vehicle control system is provided by establishing local brake control of a free moving vehicle in a classification yard in accordance with the speed of the vehicle and the detection of a target car with which the moving car is to be coupled to thereby limit the coupling impact forces between the vehicles. Reception of reflected sonic signals within a predetermined period following emission of energy waves by a periodically sounded whistle provides an indication of a moving car being within a preselected distance of a target car. Should the moving vehicle be monitored as exceeding a preselected safe coupling speed upon reception of a predetermined number of the reflected signals, the system will function to effect a brake application which will remain in effect until the vehicle speed is reduced below the preselected safe coupling speed, at which point the system is reset, releasing brakes and allowing the car to roll into a soft coupling with the target car. Fore and aft sonic transmitters and receivers are provided on each car to permit

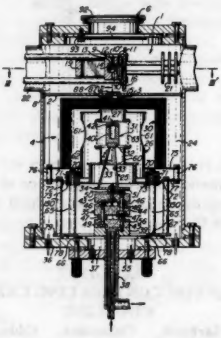
universal car positioning. The system is adapted to control a cut of cars being classified, as well as individual car classification.

3,654,457

ION SOURCE DEVICE EQUIPPED WITH SAMPLE HEATING MEANS FOR USE IN MASS SPECTROMETER

Masayoshi Yano, and Tamotsu Noda, both of Katsuta-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 11, 1969, Ser. No. 798,363
Claims priority, application Japan, Feb. 12, 1968, 43/9545
Int. Cl. H01j *39/34*
U.S. Cl. 250—41.9 S **15 Claims**



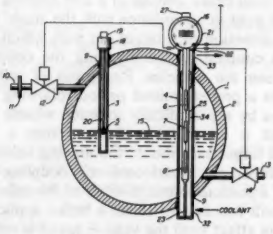
An ion source for a mass spectrometer having a sample cell containing a sample, a mesh filament surrounding the sample cell and a radiant heat shield surrounding the mesh filament, in which the sample cell is heated to a high temperature by being bombarded with thermoelectrons emitted from the filament so that the sample in the cell is vaporized and led toward the ion source to be ionized. In the device, the sample cell and the radiant heat shield are maintained at a high potential and a low potential, respectively, relative to the potential at the filament so that the thermoelectrons emitted from the filament can be accelerated toward the sample cell.

3,654,458

MEANS FOR DETECTION AND CONTROL OF LIQUID LEVEL IN A VESSEL

Bill S. Burrus, and John B. Rosso, both of Tulsa, Okla., assignors to Combustion Engineering, Inc., New York, N.Y.

Filed Jan. 6, 1969, Ser. No. 789,179
Int. Cl. G01n *23/10*
U.S. Cl. 250—43.5 FL **3 Claims**



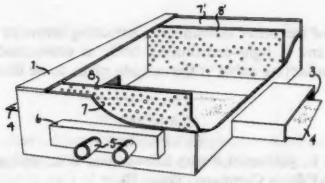
A vessel has a source and detectors of radiation emplaced within containers extended through its walls so the level of a fluid within the vessel will be detected by interference of the fluid with the reception of the radiation by the detectors.

3,654,459

CONTROLLED ATMOSPHERE CHAMBER FOR TREATING PRODUCTS WITH IONIZING RADIATION

George E. Coleman, Elmhurst, Ill., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 18, 1969, Ser. No. 850,927
Int. Cl. H01j *37/30*
U.S. Cl. 250—49.5 TE **16 Claims**



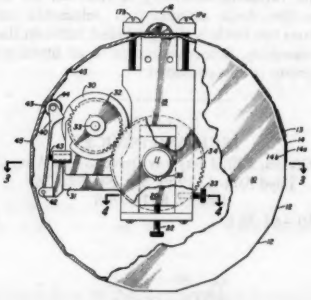
Apparatus which permits treatment of products with ionizing radiation in a controlled atmosphere comprises a chamber having inlet and outlet openings for the passage of a product to be treated, a radiation-permeable window in one surface, and at least one gas reservoir within the chamber separated by a foraminous panel. Gas is introduced into the reservoir, passes through the foraminous panel and over and around the path of travel of the workpiece to be treated.

3,654,460

AUTOMATIC SAMPLE CHANGER FOR A GONIOMETER WITH MEANS TO ACCOMODATE SAMPLES OF DIFFERENT THICKNESSES

Charles E. Payton, and Waldo C. Patterson, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Feb. 12, 1969, Ser. No. 799,154
Int. Cl. H01j *37/20*; G01n *23/20*
U.S. Cl. 250—51.5 **4 Claims**



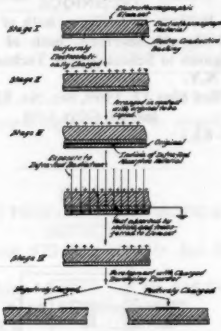
A sample holder for a goniometer consisting of a drum having a plurality of flats on the circumference of the drum adapted to position the samples properly with respect to an X-ray source and its detector. The drum contains accurate indexing means and an adjustable means for properly positioning the samples vertically to account for a variation in the thickness of a set of samples.

3,654,461

ELECTROTHERMOGRAPHIC IMAGE RECORDING PROCESS

Andre Jan Conix, Hove-Antwerp, and Paul Maria Cassiers, Mortsel-Antwerp, both of Belgium, assignors to Gevaert Photo-Producten N.V., Mortsel, Belgium

Filed Dec. 5, 1960, Ser. No. 73,518
Claims priority, application Great Britain, Dec. 4, 1959, 41,351/59
Int. Cl. G03g *13/00*
U.S. Cl. 250—65 ZE 7 Claims



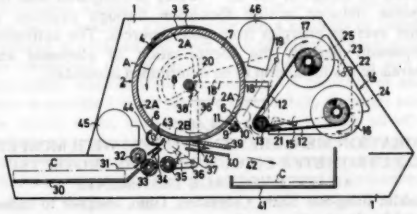
A process of electrothermographic reproduction utilizing an electrothermographic material which undergoes a decrease in electrical resistance as the temperature thereof is increased, the rate of decrease changing to a significantly higher rate at a temperature above room temperature. Preferably a span of not more than 20° C. separates the temperature at which the rate change occurs and the temperature at which the resistance of the material reaches a minimum level. Preferred electrothermographic materials are crystalline polymers having a first order transition point and amorphous polymers having a second order transition point, which transition points are above room temperature.

3,654,462

APPARATUS FOR THERMOGRAPHIC DUPLICATION OF A RADIATION ABSORBENT PICTURE

Sven Bertil Kvarnegard, Enebyberg, Sweden, assignor to Aktiebolaget Carl Lamm, Stockholm, Sweden

Filed Mar. 4, 1969, Ser. No. 804,073
Claims priority, application Sweden, Mar. 20, 1968, 3726/68
Int. Cl. B41m *5/002*
U.S. Cl. 250—65 12 Claims



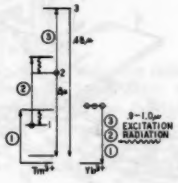
An apparatus for thermographic series-duplication of an original bearing heat radiation-absorbent indicia comprises a rotary drum having means for mounting the original on a first imprint of the external surface thereof, at least one source of infrared radiation mounted outside the drum for successively irradiating the original during the rotation of the drum, a first roller for pressing a web coated with a fusible dye into temporary contact with the original subsequent to its irradiation to cause the original to pick up dye from the web in accordance with its heated indicia pattern, and a second roller for pressing a copy sheet into temporary contact with the original subsequent to its contact with the coated web to cause the copy sheet to pick up an impront of the dye image from the original, the drum being adapted to start and stop in a predetermined angular position in which said source of infrared radiation with irradiate a second part of the external surface of the drum which is spaced from said first part thereof in a manner to prevent excessive heat transfer between the two parts.

3,654,463

PHOSPHORESCENT DEVICES

Joseph Edward Geusic, Berkeley Heights; Frederick William Ostermayer, Jr., New Providence, and Le Grand Gerard Van Uitert, Morris Township, Morris County, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 19, 1970, Ser. No. 4,006
Int. Cl. F21k *2/00*
U.S. Cl. 250—71 R 3 Claims



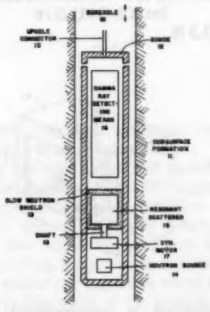
Incoherent light sources depending on phosphors which may simultaneously emit at more than one wavelength are provided with multiple dielectric coatings to suppress a portion of the emission and thereby enhance the remainder. The use of such coatings with frequency up-converting phosphors as well as down-converting phosphors is described.

3,654,464

RESONANT SCATTERING OF GAMMA RAYS AS SELECTIVE MEANS FOR DETERMINING AN ELEMENT OF INTEREST

Walter H. Johnson, Jr., Cambridge, Mass., and William C. Pritchett, Dallas, Tex., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Continuation of application Ser. No. 591,543, Nov. 11, 1966, now abandoned. This application Jan. 22, 1970, Ser. No. 6,021
Int. Cl. G01t *1/20*
U.S. Cl. 250—71.5 R 3 Claims



A radioactive logging method and apparatus for quantitatively determining an element of interest in subsurface for-

mations traversed by a borehole. Earth formations are bombarded with fast neutrons causing the various elements to emit characteristic gamma rays. These gammas strike resonant scatter material which is specially selected to elastically scatter only those gammas derived from the element of interest. The scattered gammas thus obtained are detected with a scintillator and a photomultiplier.

3,654,465

SCANNING APPARATUS FOR ISOTOPE DIAGNOSIS

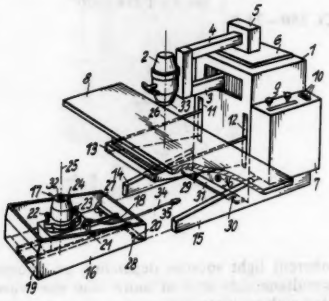
Winfried Platz, Erlangen, and Erich Kampf, Nurnberg, both of Germany, assignors to Siemens Aktiengesellschaft, Erlangen, Germany

Filed May 26, 1969, Ser. No. 869,406

Claims priority, application Germany, June 1, 1968, G 67 52 486.1

Int. Cl. G01t *1/20*

U.S. Cl. 250—71.5 S **1 Claim**



An apparatus for isotope diagnosis to determine the distribution of radioactive substances in a body. The apparatus incorporates two radiation detectors connected for synchronous scanning of an examination zone of the body, one of the detectors being mounted in an accessory accessary which is adapted for connection to the housing of the other detector.

3,654,466

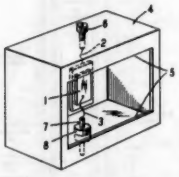
NARROW BAND ELECTROMAGNETIC, PYROELECTRIC RADIATION DEVICES USING PIEZOELECTRIC DETECTORS

Richard Lee Abrams, Morris Township, Morris County, and Alastair Malcolm Glass, Murray Hill, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 7, 1970, Ser. No. 35,131

Int. Cl. G01j *5/10*

U.S. Cl. 250—83.3 H **12 Claims**



Radiation detection is accomplished by sensing the piezoelectric response to the expansion and contraction in a crystal element due to the heating effect of the carrier energy to be sensed. Sensitivity to a subcarrier is enhanced by utilizing a frequency (of interrupted or continuous wave subcarrier) corresponding with a mechanical resonance frequency of the crystal element. The device is analogous to a conventional resonant r.f. detector element. Uses to which such prior art devices are applied may also be served with the class of inventive devices. Such uses include frequency standards, channel selectors, etc.

3,654,467

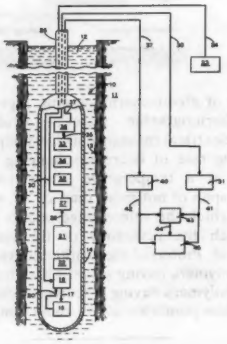
TRANSPLUTONIUM NEUTRON ACTIVATION LOGGING TECHNIQUE

Jay Tittman; William B. Nelligan, both of Danbury; John S. Wahl, and Harold Sherman, both of Ridgefield, all of Conn., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed May 12, 1969, Ser. No. 823,665

Int. Cl. G01t *3/00*

U.S. Cl. 250—83.1 **5 Claims**



A typical embodiment of the invention enables neutrons of low average energy that characteristically are emitted from californium 252 (Cf^{252}) to react with, or fail to react with, nuclei within an earth formation, depending on the energy threshold for the reaction in question. The neutron activation induced by means of the Cf^{252} source is compared with the response induced in the formation through neutrons of higher average energies from other sources. The activation comparison permits the identification of elements and minerals in the formation to be determined accurately.

3,654,468

RADIATION MEASUREMENT SYSTEM WITH MOSFET ELECTROMETER CIRCUIT WHICH IS PROTECTED AGAINST VOLTAGE TRANSIENTS

Franklin Bong-See Shah, Columbus, Ohio, assignor to Industrial Nucleonics Corporation

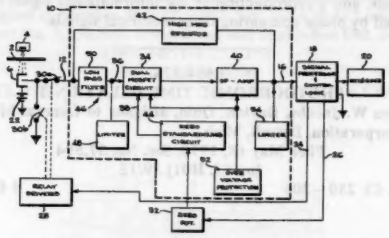
Filed Mar. 11, 1970, Ser. No. 18,644

Int. Cl. G01t *1/17*

U.S. Cl. 250—83.3 R **14 Claims**

A radiation measurement system includes an electrometer circuit employing a metal-oxide-semiconductor device as an active element for amplifying a minute d.c. input signal from a radiation detector to provide an appreciable signal output voltage. The electrometer comprises means for preventing

undesired voltage transients which may be applied with the input signal from puncturing the metal-oxide-semiconductor



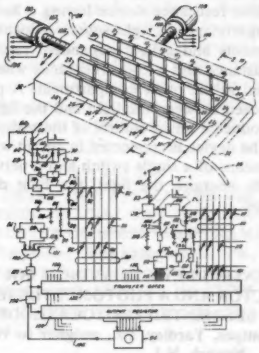
device, without impairing its ability to amplify the minute d.c. input signal.

3,654,469

MATRIX-FORM PROPORTIONAL-MODE RADIATION DETECTOR

Frederick W. Kantor, 523 West 112th St. Apt. 32, New York, N.Y.

Filed May 16, 1969, Ser. No. 825,337
Int. Cl. G01t *1/18*
U.S. Cl. 250—83.6 R **22 Claims**



A matrix-form radiation detector, operating in the proportional gas mode, is provided for indicating the *x* and *y* coordinates of each ionizing event caused by the radiation. This information is utilized to form an image of the radiation pattern being detected. The detector has a plurality of cathodes arranged in columns and rows. The cathodes in each column are connected to one another, and those in each row are electrically isolated from one another. A plurality of anode wires is provided. Each cathode substantially encircles one of the anode wires, and each wire passes through all of the cathodes in a given row. Encoding circuitry and other means are provided for encoding the address of each ionizing event, and for storing and/or displaying the encoded information.

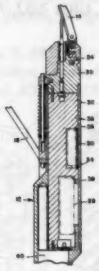
3,654,470

COMPENSATED DENSITY LOGGING SYSTEM HAVING A FILTER ONLY ON THE SHORT-SPACED DETECTOR

Billy F. Wilson, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Dec. 9, 1969, Ser. No. 883,539
Int. Cl. G01v *5/00*
U.S. Cl. 250—83.6 W **9 Claims**

A well logging instrument having a gamma ray source, a short-spaced gamma ray detector, and a long-spaced gamma ray detector is coupled through a logging cable to surface electronics. A cadmium filter is used to alter the response of the short-spaced detector. This filter causes the relationship between the counting rates measured by the long-spaced detector and the short-spaced detector as the mud cake



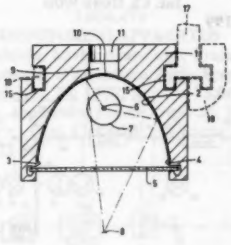
thickness is varied to be a straight line rather than a curved line when plotted on log-log graph paper. Filters composed of tin, silver, copper, nickel or iron, individually or in combinations, may be used in place of cadmium. Such straight line relationships are useful in determining true formation densities from the two counting rates.

3,654,471

REFLECTOR DEVICE

Hans Erik Nilsson, Stockholm, Sweden, assignor to A. B. Infrarodteknik, Stockholm, Sweden

Filed Nov. 6, 1969, Ser. No. 874,571
Claims priority, application Sweden, Nov. 13, 1968, 15424/68
Int. Cl. H01j *35/00*
U.S. Cl. 250—85 **5 Claims**

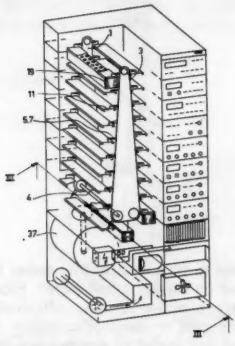


A device for reflecting electromagnetic radiation from an elongated radiation source comprising a profiled holder formed as a body having a cavity that provides a supporting surface for a reflecting metal strip. The supporting surface is shaped to partially surround said radiation source and the surface defines a groove preferably arranged behind the radiation source. The reflecting metal strip is secured to the holder by stop members integral with the body of the holder which elastically inflect the reflecting metal strip against the supporting surface. The width of the reflecting metal strip is chosen so that the reflecting metal strip is kept permanently flexed into the groove under elastic deformation in its mounted position throughout the operating temperature range.

3,654,472
APPARATUS FOR SELECTIVELY EXAMINING RADIOACTIVE SAMPLES

Jan Sjouke Hof, Waalre, and Gerardus Otten, Emmasingel, Eindhoven, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 3, 1968, Ser. No. 756,998
Claims priority, application Netherlands, Sept. 2, 1967, 6712087
Int. Cl. G01t *7/02, 7/08*
U.S. Cl. 250—106 **6 Claims**

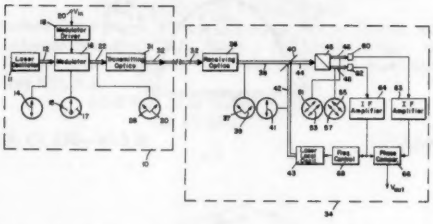


An apparatus having a series of movable trays for holding a plurality of radioactive samples, and for transporting each tray and each sample carried thereon to a shielded detection unit for examination.

3,654,473
PHASE MODULATION LASER COMMUNICATION SYSTEM

Thomas A. Nussmeier, Thousand Oakes, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 28, 1969, Ser. No. 819,865
Int. Cl. H04b *9/00*
U.S. Cl. 250—199 **4 Claims**

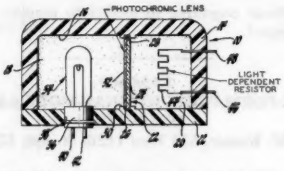


In the disclosed laser communication system, at a transmitter a linearly polarized laser carrier beam is phase modulated with an informational signal such that when the resultant beam is resolved into two linearly polarized component beams in mutually perpendicular planes the respective component beams are shifted forwardly and backwardly in phase by an amount proportional to the informational signal. In a receiver the received phase modulated beam is combined with a local oscillator laser beam which is linearly polarized in a plane parallel to the plane of polarization of the carrier beam, and the resultant beam is separated into a pair of linearly polarized laser beams in respective planes parallel to the planes of the aforementioned transmitter component beams. These linearly polarized laser beams are converted into respective intermediate frequency electrical signals, and a reproduction of the informational signal is obtained by phase comparing these electrical signals.

3,654,474
PHOTOCHROMIC TIME DELAY UNIT

James W. Jacobs, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed May 15, 1970, Ser. No. 37,594
Int. Cl. H01j *39/12*
U.S. Cl. 250—206 **1 Claim**

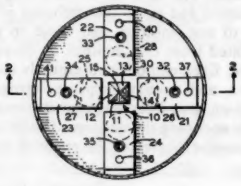


In preferred form, a time delay circuit including a light dependent variable resistance device having a housing divided into two compartments. A light source is located in one of the compartments and a light dependent resistor having a high dark resistance and a lower resistance when exposed to light is located in the other compartment. A photochromic lens is interposed between the light and the light dependent resistor to produce a timed control of the resistance value of the device. The device is connected in circuit with an electrical load by means of a single switch and a network that will simultaneously energize the light, the light dependent resistor, and load.

3,654,475
LIGHT SENSING DEVICE HAVING A POLYHEDRAL REFLECTOR AND A PHOTOMULTIPLIER WITH SEGMENTED PHOTOCATHODE

Henri L. Montpas, Yardley, Pa., assignor to Weston Instruments, Inc., Newark, N.J.

Filed Feb. 16, 1970, Ser. No. 11,529
Int. Cl. G01j *1/20;* **H01j** *39/12*
U.S. Cl. 250—203 **2 Claims**



An illustrative embodiment of the invention combines a light position sensitive photoelectric device with a light beam splitting structure in order to indicate the position of the light source relative to the device's photocathode. Primary reflecting surfaces are used to split the incoming beam of light and thereby provide improved light transmission properties.

3,654,476

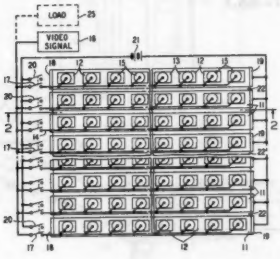
SOLID-STATE TELEVISION CAMERA DEVICES

Basil W. Hakki, Scotch Plains, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Original application May 15, 1967, Ser. No. 638,417, now Patent No. 3,536,830. Divided and this application Oct. 24, 1969, Ser. No. 871,371

Int. Cl. H01l *15/00*

U.S. Cl. 250—211 J 6 Claims



Solid-state display and light-sensitive devices are described which comprise a plurality of strips of semiconductor material each having a bulk negative conductivity and containing a plurality of light elements along one surface. A sufficiently high DC voltage is sequentially applied to the strips to excite traveling electric field domains which in turn sequentially excite the light elements. In the display devices, the light elements are light-emitting diodes, the light output of which is modulated by an applied video signal, while in the light sensitive devices, they are light sensitive diodes from which a variable voltage is taken as an output video signal.

3,654,477

OBSTACLE DETECTION SYSTEM FOR USE BY BLIND COMPRISING PLURAL RANGING CHANNELS MOUNTED ON SPECTACLE FRAMES

J. Malvern Benjamin, Jr., Philadelphia, Pa., assignor to Bionic Instruments, Inc., Bala Cynwyd, Pa.

Filed June 2, 1970, Ser. No. 42,796

Int. Cl. G06m *7/00*; H01j *5/02*, *39/12*

U.S. Cl. 250—217 SS 5 Claims

In an obstacle detection device for the blind a coherent light source is pulsed on to produce a pulse of light which is reflected by an obstacle. The reflected light is received adjacent the coherent light source and the time between the transmission and reception of the pulse is used to measure the relatively short distances involved. Solid state lasers and photopickups in such a system can be included in eye-glasses to be accommodated in the space between the lens area and the wearer's eye. Other embodiments include hand-held systems, such as a flashlight-like device, or typhlo cane combinations. A tactile stimulator directed to a sensitive body area supported on the same frame employs material which changes shape when temperature exceeds a critical level and returns to its original shape when cooled below that temperature such that internal resistance of the material under the effect of AC current constantly cyclically changes above and below the critical temperature.

3,654,478

RADIATION SENSITIVE CARD READER WITH COMPENSATION FOR OPTICAL CONTAMINATION OF THE SYSTEM

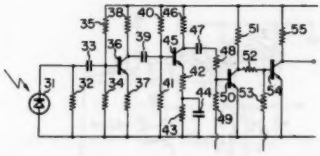
Zyoichi Fuwa, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Feb. 9, 1970, Ser. No. 9,608

Claims priority, application Japan, Feb. 14, 1969, 44/10829

Int. Cl. G08c *9/06*

U.S. Cl. 250—219 DC 7 Claims



A card reader having a light source for illuminating cards and photoelectric cells for read-out. The photoelectric cells are so arranged that they read out the space between the adjacent columns of a card when it is at rest and read out the information on the card when it is being advanced. A load resistance is coupled to each of the photoelectric cells in such a manner that the logarithm of the brightness or luminance of the light intercepted by the photoelectric cell is substantially in proportion to the output voltage. Means for eliminating DC components such as capacitors are used in coupling photoelectric cells to an amplifier for amplifying the output signals of the photoelectric cells and in coupling the stages of the amplifier to each other. The card reader is stable in operation without being adversely affected by the contamination of the optical system of the photoelectric cells, the brightness of the card, the ambient temperature variation, etc.

3,654,479

MONITORING APPARATUS

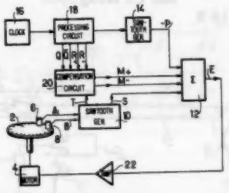
Jean-Michel Catherin, Savigny-sur-Orge, France, assignor to Compagnie Generale D'Electricite, Paris, France

Filed Sept. 24, 1970, Ser. No. 75,065

Claims priority, application France, Sept. 25, 1969, 693284

Int. Cl. G01d *5/34*

U.S. Cl. 250—231 SE 9 Claims



An apparatus for producing an output signal which is representative of the phase shift between two signals. Two input signals are used to generate a sawtooth signal which is compared to a reference sawtooth signal. The instantaneous amplitude difference between the sawtooth generated by the input and the reference sawtooth is proportional to the phase difference of these signals and an output representative of

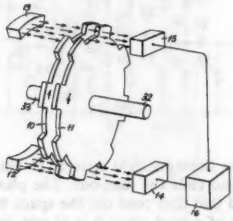
the phase difference is produced by the apparatus. The output signal can be used, for instance, to control the speed of rotation of an object.

3,654,480

TACHOGENERATORS WHICH DETERMINE THE SPEED AND ACCELERATION OF A ROTATING SHAFT BY USING TWO COUNTER ROTATING SHUTTERS

John Michael Stephenson, Leeds, England, assignor to National Research Development Corporation, London, England

Filed Oct. 8, 1970, Ser. No. 79,130
Claims priority, application Great Britain, Oct. 17, 1969, 51,137/69
Int. Cl. G01d *5/36*
U.S. Cl. 250—231 R **13 Claims**



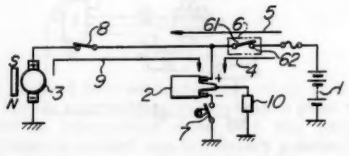
A tachogenerator for measuring the speed of a rotating shaft is described. The tachogenerator has two discs each with spaced peripheral slots; one disc is rotated at a constant speed and the other at the speed to be measured. A light beam is projected through the slots to a light sensitive device coupled to an electrical filter and a signal indicative of speed is obtained from the filter. Electrical noise in the signal from the light sensitive device is reduced by the filter. A further reduction in noise is obtained by using one or more pairs of light beams, with the beams diametrically opposed with respect to the discs. A light sensitive device is provided for each beam and these devices are coupled to the filter input. Instead the devices may be coupled to means for combining the pulse trains generated, to provide the output signal.

3,654,481

DEVICE FOR PREVENTING CONTINUATION OF IGNITION IN AN AUTOMOBILE GASOLINE ENGINE

Toshio Ishikawa, Kariya, and Yosizi Yamamoto, Toyohashi, both of Japan, assignors to Nippondenso Kabushiki Kaisha, Aichi-ken, Japan

Filed July 10, 1970, Ser. No. 53,738
Int. Cl. H02g *3/00*
U.S. Cl. 307—10 R **8 Claims**



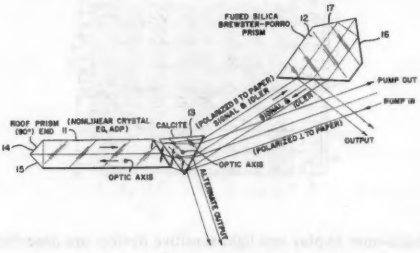
In an automobile with a load circuit consisting of an ignition coil in parallel with at least one d-c permanent magnet motor for auxiliary equipment including a car heater, a car cooler and the like, a device for preventing continuation of ignition, whereby the electric power generated by the force of inertia in said d-c permanent magnet motor is prevented from being supplied to said ignition coil when the engine key switch of the automobile is opened.

3,654,482

MIRRORLESS OPTICAL CAVITY

Gail A. Massey, San Mateo, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Mar. 12, 1971, Ser. No. 123,514
Int. Cl. H03f *7/04*
U.S. Cl. 307—88.3 **5 Claims**



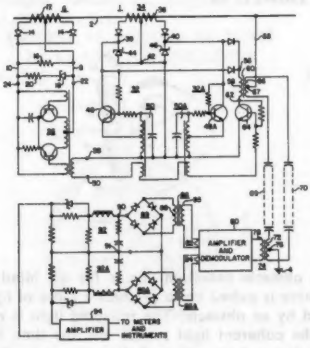
This disclosure is directed to an optical parametric oscillator operable in the visible and made of components which are not damaged by high power laser radiation or environmental effects.

3,654,483

APPARATUS FOR TRANSFERRING INTELLIGENCE BETWEEN TWO VOLTAGE LEVELS

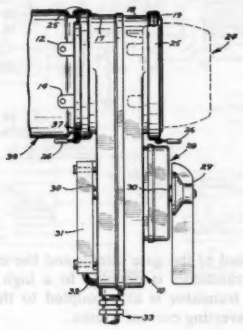
Bernard E. Lenehan, Bloomfield, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 6, 1970, Ser. No. 9,371
Int. Cl. G01r *19/26, 15/06*
U.S. Cl. 307—109 **12 Claims**



An apparatus for transferring intelligence such as current magnitude from a high potential conductor to ground potential through the capacitive effect of a coupler to eliminate the necessity of providing sufficient insulation in the current transducer to withstand the high potential difference between that of the conductor and that of ground.

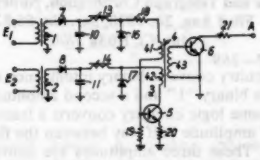
3,654,484
CONTROL APPARATUS
Harry E. Jorgenson, and Wayne W. Hansen, both of Minneapolis, Minn., assignors to Onan Corporation
Filed Aug. 21, 1970, Ser. No. 65,764
Int. Cl. H02j 1/00
U.S. Cl. 307—149 10 Claims



A system and apparatus for selectively connecting one of a plurality of sources of electrical power to a load. Apparatus is furnished to be plugged in intermediate an electrical watt hour meter and the meter receptacle normally provided in a typical electrical power utilization system that is usually designed to handle a single primary source of power. The apparatus provides for selective connection of the load distribution center to the utility power line or to another source of power which might reasonably be termed an auxiliary power source. The apparatus may easily be made to be tamper proof by the inclusion of appropriate locking seals.

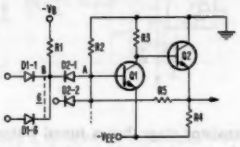
Further provision is made for manual switching or fully automatic operation including the energization of an auxiliary source of power and connection of the auxiliary source to the input terminals of the load distribution center. Suitable devices for sensing the existence of voltage are included to provide signals indicative of a need for selectively switching the input terminals of the load distribution center between one source of power or another.

3,654,485
A.C. SIGNAL LOGIC CIRCUIT
Alfred Lotz, Berlin, Germany, assignor to Licentia Patent-Verwaltugs-G.m.b.H., Frankfurt am Main, Germany
Filed June 29, 1970, Ser. No. 50,609
Claims priority, application Germany, June 28, 1969, P 19 33 713.4; Oct. 1, 1969, P 19 50 330.1; Mar. 18, 1970, P 20 14 135.9; Mar. 19, 1970, P 20 14 110.0
Int. Cl. H03k 17/00
U.S. Cl. 307—210 10 Claims



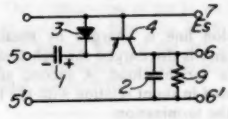
A logic circuit arrangement for dynamically coupling A.C. voltage type input signals which prevents the occurrence of an erroneous output signal in the event of a malfunction of the circuit. The input signals are fed into the circuit via separate input transformers, are rectified and are then utilized to control the pulse output voltage of a blocking oscillator circuit connected in common to all of the inputs.

3,654,486
TRANSISTOR LOGIC CIRCUIT WITH UPSET FEEDBACK
Jack S. Cubert, Willow Grove, Pa., assignor to Sperry Rand Corporation, New York, N.Y.
Continuation of application Ser. No. 452,191, Apr. 30, 1965, now abandoned. This application May 26, 1970, Ser. No. 41,698
Int. Cl. H03k 19/40, 19/22, 19/30
U.S. Cl. 307—214 11 Claims



The invention includes a semiconductor circuit and in one mode comprises two transistors wherein the first operates as a common emitter whereas the second operates as an emitter follower. When the first transistor is in a non-conducting state and the second is conducting, the input level of the first is raised to almost the conduction level by a negative feedback signal. During the time that the first transistor is turned on (the transitory period), a relatively positive feedback signal after which a negative feedback signal is provided thereto. The latter signal prevents saturation of the first transistor.

3,654,487
DIGITAL-ANALOG CONVERTER CIRCUIT
Atutoshi Okamoto, Toyohashi, and Shunji Okumura, Kariya, both of Japan, assignors to Nippondenso Kabushiki Kaisha, Aichi-ken, Japan
Filed May 6, 1970, Ser. No. 35,126
Claims priority, application Japan, May 9, 1969, 44/34664; Nov. 19, 1969, 44/93279
Int. Cl. H03k 7/00
U.S. Cl. 307—227 2 Claims



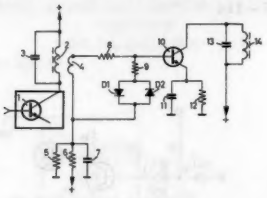
A digital-analog converter circuit wherein in a pulse interval of input pulses a first capacitor is charged by a power source through a diode, and upon the application of an input pulse the electric charge stored in the said first capacitor is discharged through a grounded-base transistor and simultaneously a second capacitor is charged by the collector current of the said second capacitor is discharged through a resistor in the next pulse interval of the said input pulses.

3,654,488

CIRCUIT ARRANGEMENT FOR LIMITING AMPLITUDE MODULATION IN A FREQUENCY MODULATED SIGNAL

Karl Traub, Furth, and Gunther Benecke, Nurnberg, both of Germany, assignors to Grundig E.M.V. Elecktro-Mechanische Versuchsanstalt, Furth/Bayern, Germany

Filed Nov. 18, 1970, Ser. No. 90,615
Claims priority, application Germany, Nov. 22, 1969, P 19 58 749.6
Int. Cl. H03k 5/08; H04b 1/10
U.S. Cl. 307—237 **2 Claims**



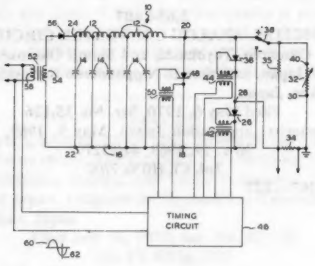
A first transistor stage has a tuned output circuit. A coil coupled to the tuned output circuit has, in parallel with it, a series circuit of a resistance and a pair of diodes connected in parallel but with opposite polarity. Terminal of the resistance not connected to the pair of diodes may be connected to the top of the coupling coil via a resistance and is connected to the base of the subsequent transistor stage.

3,654,489

PULSE GENERATOR FOR A VARIABLE LOAD

James H. Knapton, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed July 28, 1970, Ser. No. 58,883
Int. Cl. H03k 3/57, 17/72
U.S. Cl. 307—252 W **13 Claims**



A transmission line is charged by means of a floating power supply and is discharged through a silicon controlled rectifier into a variable load. A second silicon controlled rectifier, disposed in shunt relation with the line, is employed for insuring pulse termination.

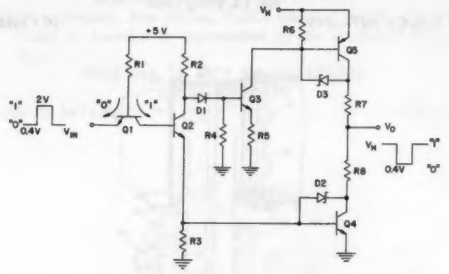
3,654,490

GATE CIRCUIT WITH TTL INPUT AND COMPLIMENTARY OUTPUTS

David T. Kan, Santa Clara, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed June 17, 1970, Ser. No. 47,084
Int. Cl. H03k 17/60
U.S. Cl. 307—255 **5 Claims**

A gate circuit having a TTL input characteristic with the input transistor forming in effect two steering diodes driving a phase splitter which has its collector and emitter respectively driving two complementary output transistors. The collectors of the output transistors coupled together form the



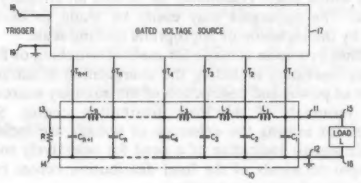
output terminal of the gate circuit and the emitter of one of the output transistors is coupled to a high voltage supply. This output transistor is also coupled to the phase splitter through an inverting current source.

3,654,491

CHIRP PULSE GENERATING CIRCUITS

Ronald Lee Earp, Burlington, N.C., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 12, 1970, Ser. No. 18,888
Int. Cl. H03k 3/53, 3/80; H03h 7/32
U.S. Cl. 307—262 **18 Claims**



Chirp pulse generating circuits using constant-K, incrementally time dispersive delay lines are disclosed. Gated sources place predetermined amounts of energy in elements of the lines. When this energy discharges, Chirp pulse output signals are produced.

3,654,492

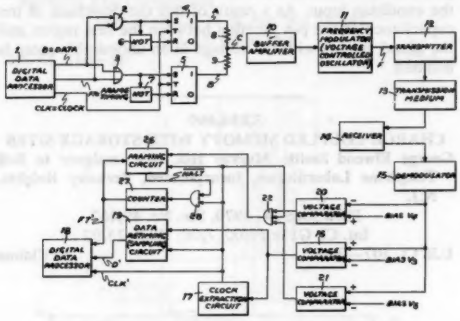
CODE COMMUNICATION FRAME SYNCHRONIZATION SYSTEM

James M. Clark, Cedar Grove, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.Y.

Filed Aug. 24, 1970, Ser. No. 66,520
Int. Cl. H03k 5/00
U.S. Cl. 307—269 **11 Claims**

Logic circuitry converts binary intelligence into a first amplitude for a binary "1" and a second amplitude for a binary "0." This same logic circuitry converts a frame timing signal into a third amplitude half way between the first and second amplitudes. These three amplitudes are converted into, for instance, three distinct frequencies with the frequency corresponding to the third amplitude being disposed half way between the frequencies corresponding to the first and second amplitudes. After transmission, the three amplitudes are recovered. A first voltage comparator having a reference voltage equal to the third amplitude recovers the binary intelligence from which a local clock is generated with the local

clock pulses being delayed to be centered in the binary digits. A pair of voltage comparators having reference voltages straddling the third amplitude, but less than the first amplitude and greater than the second amplitude and a sampling gate responding to the outputs of the pair of voltage comparators and the local clock pulses recover the frame timing signal to enable frame synchronization of the receiver with the transmitter.

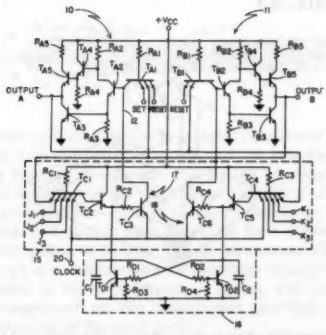


3,654,493

BISTABLE LOGIC CIRCUITS UTILIZING A CHARGE STORED DURING A CLOCK PULSE TO CHANGE THE OPERATING STATE ON THE TRAILING EDGE OF THE CLOCK PULSE

John J. Kardash, South Acton, Mass., assignor to Sylvania Electric Products Inc.

Filed June 21, 1965, Ser. No. 465,580
Int. Cl. H03k *3/286, 17/00*
U.S. Cl. 307—289 **15 Claims**



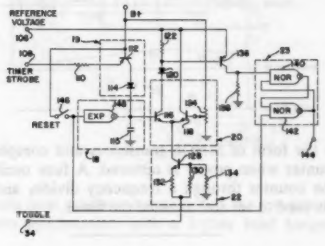
Bistable circuit having a steering circuit with two capacitances, two charging transistors, and two switching transistors. During a clock pulse, if input conditions are met, the appropriate charging transistor conducts and permits its associated capacitance to be charged. During the trailing edge of the clock pulse, the stored charge causes the appropriate switching transistor to conduct and switch the operating state of the bistable circuit.

3,654,494

CAPACITOR TYPE TIMING CIRCUIT UTILIZING ENERGIZED VOLTAGE COMPARATOR

Peter G. Bartlett; Larry K. Clark, both of Davenport, Iowa, and Frank W. Hill, Moline, Ill., assignors to Gulf & Western Industries, New York, N.Y.

Filed Aug. 20, 1968, Ser. No. 812,475
Int. Cl. H03k *17/28*
U.S. Cl. 307—293 **5 Claims**



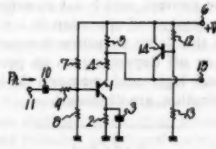
There is provided a strobed timing circuit which includes a timing capacitor connected across a voltage source for charging at a predetermined rate, and a comparator circuit for providing an output signal when the voltage across the capacitor reaches a set-in value. The comparator circuit is turned on for relatively short intervals of time to measure the voltage across the capacitor to thereby provide a comparator circuit with an apparently high input impedance.

3,654,495

PULSE PRODUCING CIRCUIT

Hajime Shinoda, Tokyo, and Takao Tsuchiya, Kanagawa-ken, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 29, 1971, Ser. No. 128,866
Claims priority, application Japan, Apr. 2, 1970, 45/28083
Int. Cl. H03k *17/28*
U.S. Cl. 307—293 **16 Claims**



A transistor circuit for producing delayed pulses includes a transistor normally biased to conduct. An incoming pulse increases conductivity and charges an RC circuit to change the bias condition. The trailing edge of the incoming pulse drives the transistor to cut-off to form the leading edge of the delayed pulse. The lagging edge of the delayed pulse occurs when the RC circuit discharges enough to allow the transistor to return to normal conductivity.

3,654,496

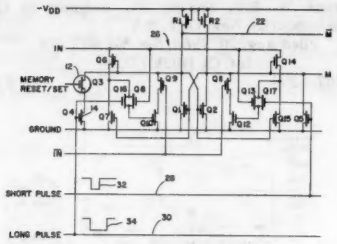
ELECTRIC TIMER WITH NONVOLATILE MEMORY

Friedrich W. Flad, Rockville, Md., assignor to The United States of America as represented by the Secretary of the Army

Continuation-in-part of application Ser. No. 845,001, July 25, 1969. This application Apr. 30, 1970, Ser. No. 33,458
Int. Cl. H03k *19/08*
U.S. Cl. 307—304 **12 Claims**

Disclosed is an electronic digital timer with a nonvolatile memory particularly adapted for use in the fuze of an artil-

lery projectile. The timer comprises a main counter in the form of a series of integrated circuit flip-flops, each having its own memory. A predetermined count is set into the memo-



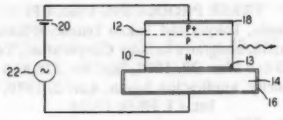
ries in the form of MNOS transistors and complemented in the counter when power is restored. A fuze oscillator actuates the counter through a frequency divider and scaler. A setter is used to set and monitor the timer.

3,654,497

SEMICONDUCTOR LASERS UTILIZING INTERNAL SATURABLE ABSORBERS

John C. Dyment; Thomas L. Paoli, both of Chatham, and Jose' E. Ripper, North Plainfield, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Dec. 1, 1969, Ser. No. 881,185
Int. Cl. H01s *3/18*; **H03k** *19/08, 19/02, 19/30*
U.S. Cl. 307—312 **13 Claims**



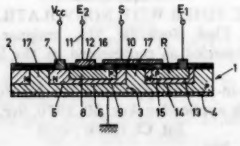
Trapping centers are controllably introduced into a junction laser by diffusing a P^+region to within at least 1.5μ of the junction. The centers, which act as saturable absorbers, produce bistable regions of operation in c.w. junction lasers operating above the delay transition temperature, the laser being either on or off depending on its previous history of operation. Optical logic and memory devices, as well as methods for fabrication, are discussed.

3,654,498

SEMICONDUCTOR DEVICE HAVING AN INTEGRATED PULSE GATE CIRCUIT AND METHOD OF MANUFACTURING SAID DEVICE

Claude Chapron, Caen, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 19, 1970, Ser. No. 21,165
Claims priority, application France, Mar. 24, 1969, 6908560
Int. Cl. H01l *19/00*
U.S. Cl. 307—303 **7 Claims**



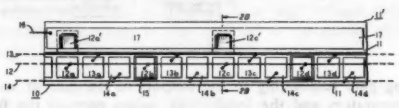
A semiconductor device having an integrated pulse gate circuit which device comprises a preferably grounded first region of a first conductivity type in which an island of the second conductivity type is provided which is preferably applied to the highest supply voltage, in which island, according to the invention, a surface zone of the first conductivity type is provided. This surface forms a plate of a capacitor which is connected on the other side to the trigger input. The surface zone is furthermore d.c. connected to the output of the pulse gate and to a resistor, the other side of which is connected to the condition input. As a result of this the drawback of the capacitance of the p-n junction between the first region and the island varying with the voltage in an undesirable sense is avoided.

3,654,499

CHARGE COUPLED MEMORY WITH STORAGE SITES

George Elwood Smith, Murray Hill, N.J., assignor to Bell Telephone Laboratories, Incorporated, Berkeley Heights, N.J.

Filed June 24, 1970, Ser. No. 49,462
Int. Cl. G11c *19/00, 7/00*; **H03k** *25/02*
U.S. Cl. 307—304 **30 Claims**



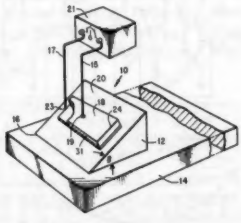
The specification describes a variety of charge coupled memory devices most of which are "read-only" memories in which the charge capacity of selected sites is permanently or semipermanently fixed. If charge is accumulated in these sites to the equilibrium amount and then shifted to an output site, the signal will reflect the programmed capacity of the sites.

3,654,500

APPARATUS FOR CONVERTING BULK WAVES TO RAYLEIGH WAVES AT MICROWAVE FREQUENCIES

Lewis T. Claiborne, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed June 11, 1970, Ser. No. 45,453
Int. Cl. H01v *7/00*
U.S. Cl. 310—8.3 **6 Claims**



Chalcogenide glass is deposited on a nonpiezoelectric substrate by vapor deposition techniques to form thereon a wedge of chalcogenide glass, the sloping surface of the wedge being disposed at a preselected angle with the surface of the substrate. The interface between the substrate and the chalcogenide glass thus deposited is substantially free from defects that generate acoustical interference at high frequencies. A piezoelectric transducer is then evaporated onto the surface of the wedge. A microwave frequency signal applied to the transducer generates bulk waves in the chalcogenide glass wedge. These bulk waves propagate through the wedge

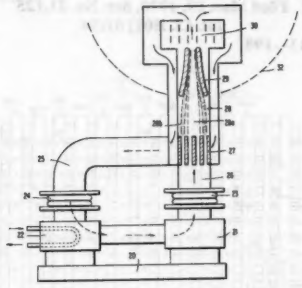
and impinge the substrate at regularly spaced intervals, thereby generating Rayleigh (surface) waves in the substrate.

3,654,501

FLOWING LIQUID ELECTROSTATIC GENERATORS

Philip E. Secker, Anglesey, North Wales, Great Britain, assignor to KDI Corporation

Filed Mar. 23, 1970, Ser. No. 21,742
Int. Cl. H02n *3/00*
U.S. Cl. 310—10 **2 Claims**



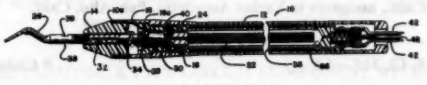
Radial charge migration in the field emitting injector/collector interspace region of flowing liquid electrostatic generators is significantly reduced by forming a sheath of uncharged liquid with a high axial velocity concentric with the charged liquid leaving the injector, thereby sweeping to the collector any charge carriers which undergo radial charge migration.

3,654,502

ULTRASONIC TOOL

Delio Carmona; Harvey Diamond, and Joachim Maliga, all of Brooklyn, N.Y., assignors to Countronic Corp., Brooklyn, N.Y.

Filed June 24, 1970, Ser. No. 49,247
Int. Cl. H01v *9/00*
U.S. Cl. 310—26 **8 Claims**



An ultrasonic tool disclosed in a dental instrument embodiment. The tool includes a working tool tip attached to the front of a velocity transformer and a stack of magnetostrictive plates attached to the rear of the velocity transformer. Each magnetostrictive plate is supported solely at its front end, the rear end of each plate being free from connection to either other plates or to any support structures. The water flow through in a continuous axial direction through an axial fluid conduit in the transformer. A spring and hexogonal flange arrangement on the transformer provides multiple radial positioning of the work tool.

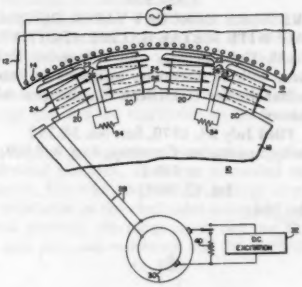
3,654,503

SYNCHRONOUS MOTORS WITH FIELD STARTING RESISTOR ARRANGEMENT

Eugene C. Whitney, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 24, 1970, Ser. No. 75,218
Int. Cl. H02k *19/00*
U.S. Cl. 310—162 **6 Claims**

A synchronous motor is provided with starting resistors connected on each field coil or between pairs of field coils so as to confine the induced field current to only the portion of the field coils nearest the air gap. This results in less flux leakage and increases the contribution to pull-in torque of



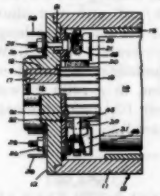
the field coils near synchronous speed so the machine can be brought into synchronism with a higher load torque than otherwise.

3,654,504

BRUSH MECHANISM

Robert A. Susdorf, and Fredrick J. Armstrong, both of Fort Wayne, Ind., assignors to General Electric Company

Filed Mar. 29, 1971, Ser. No. 128,873
Int. Cl. H02k *13/00*
U.S. Cl. 310—239 **11 Claims**



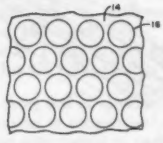
A brush mechanism for a dynamoelectric machine including an insulating mounting plate or yoke having locating means adapted to position two or more brush boxes. Brush boxes are accurately positioned and permanently mounted to the yoke prior to the mounting of the mechanism to the machine. The yoke also includes means for accurately positioning the mechanism on the machine housing. Each brush box is a one piece stamped and formed member fabricated of steel material and includes an integral spring post to which is mounted a spring for biasing the brush against the peripheral surface of the commutator of the machine.

3,654,505

BLACK ENAMEL GLASS FOR CATHODE-RAY TUBE

Earl K. Davis, Tempe; Kent W. Hansen, Scottsdale, both of Ariz., and Yemmanur Jayachandra, Melrose Park, Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed June 5, 1970, Ser. No. 50,405
Int. Cl. H01j *31/20;* **H01k** *1/26;* **H01j** *29/18*
U.S. Cl. 313—92 B **1 Claim**



A faceplate of a color cathode ray tube has a black enamel glass with holes interspaced therethrough. Color phosphor

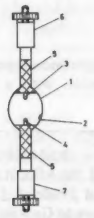
areas are positioned within the holes in the black enamel glass.

3,654,506

HIGH PRESSURE MERCURY VAPOR DISCHARGE LAMP WITH METAL HALIDE ADDITIVE

Bernhard Kuhl, Geiselgasteig, and Alexander Dobrusskin, Taufkirchen, both of Germany, assignors to Patent-Treuhand-Gesellschaft, für elektrische Gluhlampen mbH, Munich, Germany

Filed July 27, 1970, Ser. No. 58,292
Claims priority, application Germany, Aug. 8, 1969, P 19 40 539.1
Int. Cl. H01j *61/12*
U.S. Cl. 313—184 **6 Claims**



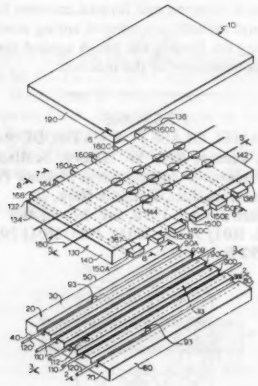
High pressure mercury vapor discharge lamp without outer jacket and with a wall loading of between 10 and 100 W/cm² preferably 20–60 W/cm² and a medium arc length corresponding to a load per cm of arc length of between 100 and 1000 W/cm, preferably 150–850 W/cm. Additives of thallium halide and halides of rare-earth metals, preferably of thulium and holmium, in a ratio of weight of halogen to metal between 2 and 10. Color temperature is 6,000° K, index of color rendition 92.

3,654,507

DISPLAY PANEL WITH KEEP ALIVE CELLS

Bernard Caras, Princeton, N.J., and James A. Ogle, Paoli, Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jan. 29, 1970, Ser. No. 6,838
Int. Cl. H01j *61/54*
U.S. Cl. 313—198 **11 Claims**



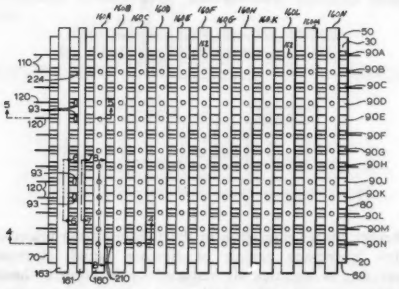
A display panel includes a plurality of rows and columns of display cells and anode and cathode electrodes associated therewith for causing glow discharge. The panel includes auxiliary starter or reset cells for facilitating the turn-on of the display cells and several keep-alive cells, including at least one uniquely located and constructed keep-alive cell, for facilitating the operation of the reset cells.

3,654,508

DISPLAY PANEL HAVING A PLURALITY OF DISPLAY REGISTERS

Bernard Caras, Princeton, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 19, 1970, Ser. No. 21,125
Int. Cl. H01j *61/54*
U.S. Cl. 313—198 **7 Claims**



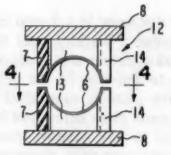
A display panel includes a plurality of display cells arrayed in rows and columns, with electrodes coupled to the cells in such a way that a plurality of rows of characters can be displayed, with blank spaces being provided between the rows of characters. Electrodes may be provided in these blank spaces to perform an auxiliary function such as a keep-alive function.

3,654,509

DIELECTRICALLY SUPPORTED HELIX DERIVED SLOW WAVE CIRCUIT

Allan W. Scott, and Yukio Hiramatsu, both of Los Altos, Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed Dec. 14, 1970, Ser. No. 97,687
Int. Cl. H01j *25/34*
U.S. Cl. 315—3.5 **9 Claims**



A dielectrically supported helix derived slow wave circuit and microwave tube using same is disclosed. A topologically equivalent ring and bar slow wave circuit is supported from mutually opposed concave trough-shaped surfaces of a serpentine-shaped dielectric support structure, as of ceramic. The outer edges of the serpentine support structure are bonded to the inner surface of a metallic barrel structure surrounding the slow wave circuit. An array of metallic fins extend from the barrel into a region adjacent the slow wave circuit and in between adjacent ring portions of the ring and bar circuit for decreasing the dispersiveness of the ring and bar circuit at the low frequency end of the operating range

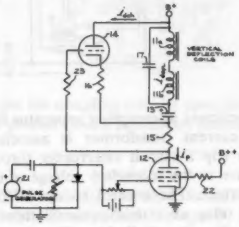
whereby the useful bandwidth of the tube is greatly increased.

3,654,510

DIRECT DRIVE VERTICAL DEFLECTION SYSTEM UTILIZING A STORAGE CAPACITOR AND DISCHARGE TUBE IN PLACE OF AN OUTPUT TRANSFORMER

William R. Seader, Owensboro, Ky., assignor to General Electric Company

Filed Nov. 14, 1969, Ser. No. 876,669
Int. Cl. H01j *29/76*
U.S. Cl. 315—29 **12 Claims**



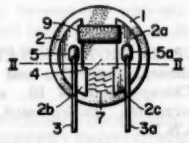
An efficient, comparatively inexpensive, direct-drive vertical deflection system for a television picture tube has been provided. The system employs a storage capacitor and a discharge tube in place of the usual vertical output transformer. The vertical output power tube controls the current supplied to the vertical deflection coils to sweep the lower half of the television picture tube screen. During the period while the lower half of the picture tube screen is being swept, energy is stored in a capacitor connected in series with the vertical deflection coils. The energy stored in this capacitor then supplies the current used to sweep the upper half of the screen. This current is made available through the discharge tube at a controlled rate and flows in an opposite direction through the deflection coils so as to cause the electron beam to be swept from the top of the screen to the middle. A high efficiency is obtained by reason of the storage capacitor and discharge tube because energy which normally would be dissipated in the output power tube is used to supply current for the upper half of the sweep.

3,654,511

RC COMPOSITE TYPE CIRCUIT COMPONENT WITH DISCHARGE GAP

Shoichi Iwaya, Akita, Japan, assignor to TDK Electronics Company Ltd., Tokyo, Japan

Continuation-in-part of application Ser. No. 717,602, Apr. 1, 1968. This application Sept. 25, 1970, Ser. No. 75,648
Int. Cl. H01j *17/36*
U.S. Cl. 315—59 **7 Claims**



A resistance-capacitor-discharge gap electric circuit component wherein the electrodes are respectively formed on both sides of a dielectric sheet and one of said electrodes in divided into two portions. The divided portions are symmetrical and provided on the respectively faced position with a space between them. The electrodes are printed on the dielectric sheet with electrically conductive material made of the mixture of 3 to 7 per cent, by weight, of the glass powder colloidal state having low melting point and fine silver powder, mixed with several per cent of organic solvent, such as toluol, tetraline, or cator oil.

A discharge gap, which is narrower than the above mentioned interval, is formed between said two divided portions of the electrode, and said two divided portions are bridged with a resistance. A sheet of electrode is provided on the rear side of the dielectric sheet at the corresponding position of the discharge gap and the electrodes on the front side of the sheet.

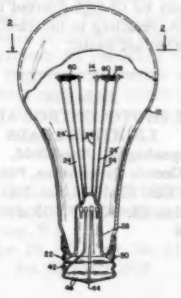
When a higher voltage than required is applied between the two divided portions, discharge is carried out through said resistance, but when such a high voltage as might break down the resistance or the electrodes is applied between said two divided portions, discharge is carried out through said discharge gap, and said resistance and the electrodes escape damage.

3,654,512

LAMP WITH SUPPORT FOR FILAMENT TO EXTEND LIFE OF FILAMENT AND ENVELOPE FILLED WITH KRYPTON AND/OR XENON

Joseph Spiteri, Erie, Pa., assignor to Truck-Lite Company, Inc., Jamestown, N.Y.

Continuation-in-part of application Ser. No. 785,909, Dec. 23, 1968. This application May 14, 1970, Ser. No. 37,183
Int. Cl. H01j *7/44*
U.S. Cl. 315—64 **1 Claim**



The specification discloses a lighting system which uses a low voltage lamp filament of a certain increased length to which a predetermined reduced voltage is applied, which is less than the rated voltage of the lamp. The lamp filaments are each supported at their ends on rods and a rod having an insulating grommet is supported between each pair of rods which support the ends of the filament to support the intermediate part of the filament. Thus the center rod support acts on the filament as a support for two parts of a cantilever beam.

3,654,513

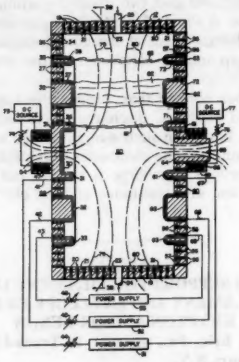
ARC HEATER APPARATUS AND METHOD FOR PRODUCING A DIFFUSE ARC DISCHARGE

Joel B. Hammer, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 30, 1969, Ser. No. 846,158
Int. Cl. H01j *17/26*
U.S. Cl. 315—111 **12 Claims**

An arc heater has three sets of substantially equally axially spaced annular electrodes of progressively increasing diameters coaxially mounted with respect to each other and electrically insulated from each other. Near the electrodes there are mounted magnetic field coils which set up magnetic fields

which cause the arcs to move substantially continuously around the electrodes, the arcs being produced by connecting oppositely disposed electrodes of each set to terminals of opposite polarity of a source of potential. The arc between the pair of electrodes of smallest diameter and the arc



between the pair of electrodes of largest diameter prevent loss of heat to the walls of the pressure vessel from the arc between the pair of electrodes of intermediate diameter; the last named arc may be of high current and have a diffused mode of operation, resulting in increased heating efficiency of gas admitted to the arc heater.

3,654,514

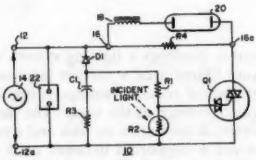
SOLID-STATE PHOTOCONTROL APPARATUS FOR LIGHTING LOADS

George A. Kappenhagen, Northfield, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 12, 1970, Ser. No. 80,081

Int. Cl. H05b *37/02, 39/04*

U.S. Cl. 315—156 **10 Claims**



A simple solid-state photocontrol apparatus for controlling the operation of lighting loads comprises a series-connected rectifier and RC combination which generates a DC potential. A series-connected photocontrol element and a fixed resistor connect to the generated DC potential and under nighttime conditions, an increased potential is developed across the photocontrol element. The gate circuit of an AC symmetrical switch is connected intermediate the fixed resistor and the photocontrol element, and when the voltage applied to the gate circuit reaches a predetermined value as nighttime approaches, the AC symmetrical switch conducts to operate the lighting load. The symmetrical switch remains conducting until the resistance of the photocontrol element again decreases due to daytime conditions.

3,654,515

LEAKAGE CURRENT INTERRUPTING APPARATUS

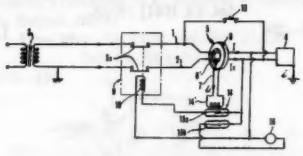
Tomio Kato, and Hifumi Nitta, both of Kasugai, Japan, assignors to Chubu Seiki Kabushiki Kaisha, Aichi-ken, Japan

Filed June 9, 1970, Ser. No. 44,722

Claims priority, application Japan, June 26, 1969, 44/60126; 44/60127; Jan. 23, 1970, 45/6534

Int. Cl. H02h *3/28*

U.S. Cl. 317—18 D **1 Claim**



In a leakage current interrupting apparatus for feeder lines a zero-phase current transformer is associated with the feeder lines to trip a circuit interrupter through a control means responsive to the secondary voltage of the zero-phase current transformer. The control means is comprised by a magnetic reed relay or a unidirectional three-terminal element such as a silicon controlled rectifier element.

3,654,516

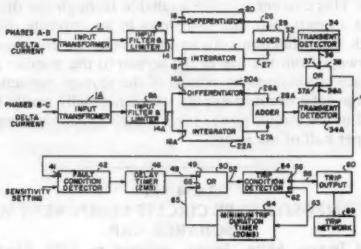
CHANGE OF CURRENT OR VOLTAGE ACUTATED PROTECTING RELAY

Maurizio Traversi, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 6,243, Jan. 27, 1970, now abandoned. This application Apr. 7, 1971, Ser. No. 131,990

Int. Cl. H02h *3/26*

U.S. Cl. 317—27 R **15 Claims**



A control device responsive to a change in magnitude and/or phase of an alternating potential sine wave signal in which a first quantity derived by integrating the signal is compared with a second quantity derived by differentiating the signal.

3,654,517

BUS COUPLER PROTECTION CIRCUIT

John Thomas Mahoney, Naperville, and Garold Stephen Tjaden, West Chicago, both of Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

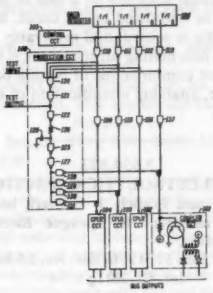
Filed Sept. 3, 1970, Ser. No. 69,368

Int. Cl. H01h *47/18*

U.S. Cl. 317—33 R **9 Claims**

A protection circuit for data bus transmission coupling circuits is provided to protect the coupling circuits from injury due to the application of abnormally long duration pulses.

The protection circuit is responsive to data pulses to be transmitted via the coupling circuits and generates inhibit



signals to inhibit the coupling circuits upon the occurrence of data pulses of greater than a prescribed duration.

3,654,518

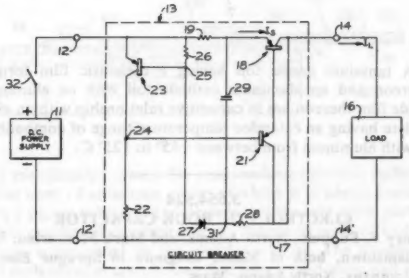
FAST ACTING SOLID STATE CIRCUIT BREAKER

Weldon L. Phelps, Dunlap, and Kerwyn B. Smith, Decatur, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 17, 1970, Ser. No. 73,098

Int. Cl. H02h *3/08*

U.S. Cl. 317—33 R **2 Claims**



A circuit breaker includes a voltage sensing resistor and a transistor for transmitting current from a DC power source to a load. Conduction through the transistor is controlled by additional solid state circuit elements which respond to an increased voltage drop across the resistor by stopping conduction through the transistor with a regenerative feedback action whereby the current from the source to the load is cut off abruptly in response to an increase of the load current above a predetermined level. The circuit breaker has no moving contacts or the like and resets automatically when the circuit from the power supply to the load is opened by switch means or the like. The circuit breaker dissipates very little power in either the open or closed condition and the components may be included with the load circuit itself whereby the circuit breaker cannot readily by bypassed by a jumper connection or the like.

3,654,519

CIRCUIT BREAKER INCLUDING IMPROVED OVERCURRENT PROTECTIVE CIRCUIT

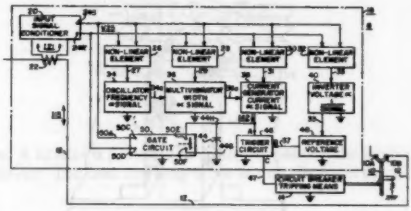
William H. South, McKeesport, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 18, 1971, Ser. No. 116,496

Int. Cl. H01h *47/18*

U.S. Cl. 317—36 TD **16 Claims**

An overcurrent protective circuit or means comprising static solid state non-linear elements connected in parallel with an input signal conditioning means such that an overload current in a protected circuit is sensed by the input signal conditioning means and then converted into a signal which is applied simultaneously to each of the non-linear elements. An output current which is directly proportional to or varies with the value of overcurrent in the protected circuit is generated by each non-linear element after the overload current exceeds predetermined values which may be different for the respective non-linear elements. The output from each of the non-linear elements, is supplied to a corresponding associated modulating means such as an oscillator, multivibrator or current generator. These modulating means combine



to generate a current signal that is proportional to the overload current in the protected circuit raised to some power N where N is related to the number of modulating means. This current is then applied to charge a capacitor which effectively integrates the current with respect to time. Integration converts the charging current into a voltage signal which is directly proportional to the Nth power of the overload current in the protected circuit. The voltage signal is then compared with a reference or threshold voltage in a trigger circuit and when it exceeds the reference voltage, a signal is generated by the trigger circuit which actuates a circuit breaker tripping means causing the circuit breaker protecting the aforementioned circuit to open or trip.

3,654,520

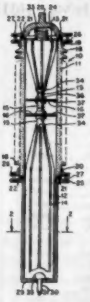
HIGH VOLTAGE SURGE DIVERTER

Peter Graneau, Concord, Mass., assignor to Interpace Corporation, Parsippany, N.J.

Filed Apr. 20, 1971, Ser. No. 135,588

Int. Cl. H02h *9/06*

U.S. Cl. 317—61 **5 Claims**



A new technique for diverting high-voltage surges due to lightning or switching operations from a power line to ground. The surge diverting discharge takes place across the surface of solid dielectric insulators placed in an evacuated space inside a dielectric tube. Metallic ion shields are provided which intercept the discharge path and uphold a voltage between the electrodes of the diverter. The device has a

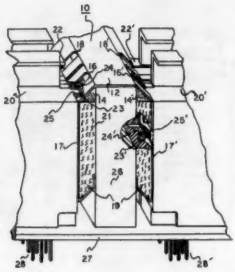
more stable triggering level than prior art lightning arresters and it prevents the flow of power followthrough currents.

3,654,521

ELECTRONIC CARD MODULE THERMAL CLIP

Rush V. LaSelle, Pittsfield, Mass., assignor to General Electric Company

Filed Jan. 13, 1971, Ser. No. 106,135
Int. Cl. H05k 7/20; H02b 1/04
U.S. Cl. 317—100 **10 Claims**



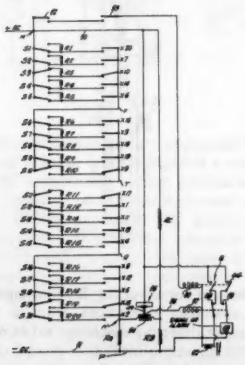
A thermal clip is provided for an electronic card module which physically supports as well as conducts heat away from the module. The clip has a slotted construction and is fashioned from a metal sheet so as to have a hollow interior cavity which contains a metal-filled elastomeric material that is in physical contact with edge elements of the module. The clip member is supported by metal frame means which houses a plurality of modules and said frame can have a hollow interior for passage of a gaseous coolant to help conduct heat away from the modules. Additional heat removal can be provided in the form of a cold plate which carries liquid coolant and contacts the support frame for the modules.

3,654,522

SECURITY CONTROL DEVICE

Gordon S. Isserstedt, 106 Poplar Plains Road, Toronto 7, Ontario, Canada

Continuation of application Ser. No. 693,039, Nov. 28, 1967, now abandoned , which is a continuation-in-part of application Ser. No. 533,682, Mar. 11, 1966, now abandoned. This application July 9, 1970, Ser. No. 53,643
Int. Cl. H04q ; H01h 47/00
U.S. Cl. 317—134 **23 Claims**



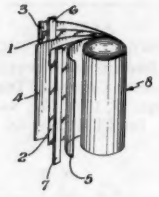
A circuit switched from a first state to a second state only when a correct combination of switches in the circuit are actuated, and a series of unique mating arrangements of switch selectors for actuating a correct combination of switches, the circuit being switched to its second state only when a mating arrangement of switch selectors on a pair of security devices such as punched or embossed credit cards, keys, dial combinations or the like is sensed, and preferably giving a warning signal when a non-mating arrangement is sensed. A multiplicity of different combinations of mating pairs of security devices is possible, enabling identification of each individual user of the circuit.

3,654,523

WET ELECTROLYTIC CAPACITORS

Mark Markarian, and Francis J. Gamari, both of Williamstown, Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed July 17, 1970, Ser. No. 55,867
Int. Cl. H01g 9/04
U.S. Cl. 317—230 **8 Claims**



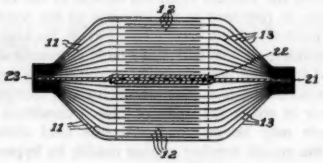
A tantalum anode foil having a dielectric film formed thereon and an aluminum cathode foil with an aluminum oxide film thereon are in capacitive relationship with an electrolyte having an extended temperature range of compatibility with aluminum from between −55° to 125° C.

3,654,524

ELECTROLYTIC BOOK CAPACITOR

Henry F. Puppolo, North Adams, and Mark Markarian, Williamstown, both of Mass., assignors to Sprague Electric Company, North Adams, Mass.

Continuation-in-part of application Ser. No. 19,192, Mar. 13, 1970. This application Apr. 28, 1971, Ser. No. 138,029
Int. Cl. H01g 9/04
U.S. Cl. 317—230 **4 Claims**



An electrolytic book capacitor having three rolled and flattened foil units welded to each side of a stripline which consists of two conductive plates separated by an insulative layer. Each rolled foil unit has extended anode and cathode foils separated from each other by paper spacers. The anode foils are connected both electrically and physically to each other and to their respective stripline plate and the cathode foils are connected to each other and to the cathode stripline plate.

3,654,525

ELECTROCHEMILUMINESCENT DEVICE INCLUDING ONE OF NAPHTHACENE, PERYLENE AND 5, 6, 11, 12-TETRAPHENYL-NAPHTHACENE IN APROTIC SOLVENT

Donald Leonard Maricle, Ridgefield, and Michael McKay Rauhut, Norwalk, both of Conn.

Continuation-in-part of application Ser. No. 382,408, July 13, 1964, now abandoned. This application Oct. 23, 1965, Ser. No. 504,111

Int. Cl. H01g 9/00; B01k 3/00

U.S. Cl. 317—230 1 Claim

1. An electroluminescent device including a container having disposed therein a pair of electrodes and a solution of a polynuclear condensed aromatic hydrocarbon in an aprotic solvent, the said aromatic hydrocarbon being selected from the group consisting of naphthacene, perylene and 5, 6, 11, 12-tetraphenylnaphthacene, the said electrodes and container being chemically inert with respect to said solution.

3,654,526

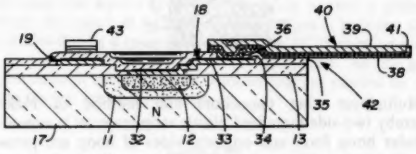
METALLIZATION SYSTEM FOR SEMICONDUCTORS

James A. Cunningham, Houston; Clyde R. Fuller, Plano; Robert C. Hooper, and Robert H. Wakefield, both of Houston, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 19, 1970, Ser. No. 38,817

Int. Cl. H01l 5/02

U.S. Cl. 317—234 R 5 Claims



A metallization system for semiconductor devices includes a first layer of aluminum a part of which is in ohmic contact with a silicon substrate and devices thereon, the other part of which overlies an insulating layer. A second layer of molybdenum is deposited on the aluminum layer. The aluminum and molybdenum are photoetched into a predetermined pattern which ohmically contacts the silicon and overlies an insulating layer, usually of silicon dioxide. Thereafter a variety of techniques and lead systems can be used. For example, a second layer of insulating material can be applied over the first level aluminum-molybdenum metallization system and the first layer of insulating material. The second level of insulating material can then be selectively etched to expose predetermined portions of the first level lead system. Thereafter, beam leads can be attached to the first level metallization system; or bonding pads can be formed in ohmic contact with the first level metallization system. Alternatively, a second level metallization system can be utilized where it becomes necessary to conductively connect various components on the semiconductor device by lead crossovers. A third layer of insulating material can then be applied on top of the second level metallization system. After selective etching of the second level insulating material, beam leads, bonding pads or even a third level metallization system can be applied.

3,654,527

UNITARY FULL WAVE INVERTER

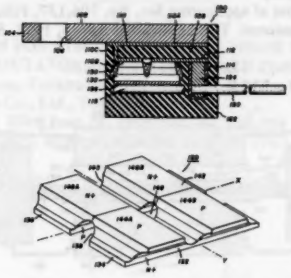
Joseph A. McCann, Auburn, N.Y., assignor to General Electric Company

Filed July 27, 1970, Ser. No. 58,272

Int. Cl. H01l 3/00, 5/00

U.S. Cl. 317—234 R 9 Claims

A semiconductor device is provided with four diodes integrated into a single monocrystalline semiconductive element. The semiconductive element is thermally coupled to a tab mounted heat sink through an electrically insulative substrate. A header is provided to relatively position the leads of the device. The heat sink may serve as one electrical connector.



3,654,528

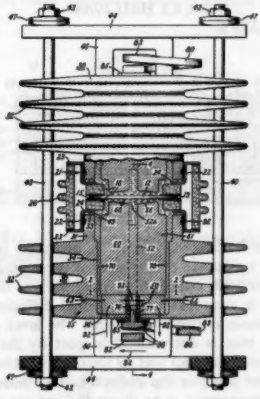
COOLING SCHEME FOR A HIGH-CURRENT SEMICONDUCTOR DEVICE EMPLOYING ELECTROMAGNETICALLY-PUMPED LIQUID METAL FOR HEAT AND CURRENT TRANSFER

Philip Barkan, Media, Pa., assignor to General Electric Company

Filed Aug. 3, 1970, Ser. No. 60,329

Int. Cl. H01l 3/00, 5/00

U.S. Cl. 317—234 R 23 Claims



A rectifier assembly comprises (a) a wafer primarily of semiconductor material having a pair of faces at opposite sides thereof and (b) a pair of liquid-metal cooling systems respectively located at opposite sides of the wafer. Each cooling system comprises a heat sink adjacent the wafer and a fluid circuit comprising a first passage extending through the heat sink and a second passage extending along a face of the wafer and feeding the first passage. Each cooling system further comprises, electrically in series with the wafer, an electromagnetic pump that is effective when energized by current through the rectifier assembly to force liquid metal coolant to flow around said fluid circuit, extracting heat from said wafer while flowing through said second passage and releasing heat to said heat sink when flowing through said first passage.

3,654,529

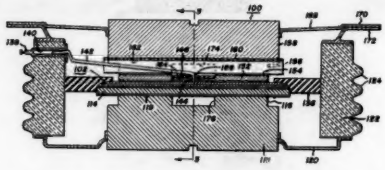
LOOSE CONTACT PRESS PACK

Donald E. Lord, Skaneateles, N.Y., assignor to General Electric Company

Continuation of application Ser. No. 796,137, Feb. 3, 1969, now abandoned. This application Apr. 5, 1971, Ser. No. 131,403

Int. Cl. H01l *3/00, 5/00*

U.S. Cl. 317—234 R **3 Claims**



A backup plate having a low thermal coefficient of expansion is loosely interposed between a terminal member of a device housing and a semiconductive element container therein. A thin protective layer is interposed between the backup plate and semiconductive element and overlies a surface of the element adjacent a diffused junction. A resilient annular junction passivant ring centers the semiconductive element within the housing, protects the semiconductive element against laterally transmitted mechanical shocks, and locates the backup plate.

3,654,530

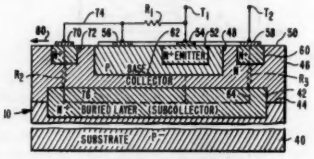
INTEGRATED CLAMPING CIRCUIT

Robert H. F. Lloyd, Sunnyvale, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of application Ser. No. 752,348, Aug. 13, 1968, now abandoned. This application June 22, 1970, Ser. No. 48,942

Int. Cl. H01l *19/00*

U.S. Cl. 317—235 R **2 Claims**



An integrated clamping circuit is provided in which the bulk collector resistance of a transistor is coupled to the base contact by a second collector contact to bias the collector-base junction in response to a potential difference between the base and main collector contacts. The level of collector-base junction bias is determined in part by the size of the auxiliary collector contact and its location relative to a heavily doped buried layer in the collector. The biased transistor conducts in a manner so as to clamp the voltage at the output terminal of an associated electrical device for load current above a threshold value.

3,654,531

ELECTRONIC SWITCH UTILIZING A SEMICONDUCTOR WITH DEEP IMPURITY LEVELS

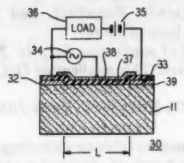
Robert H. Krambeck, North Plainfield; Peter T. Panousis, New Providence, and Robert J. Strain, Plainfield, all of N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Oct. 24, 1969, Ser. No. 869,180

Int. Cl. H01l *11/00*

U.S. Cl. 317—235 P **6 Claims**

An electronic two-terminal switch is furnished by a metal-semiconductor-metal (MSM) layered structure, in which both of the metal layers form ohmic contacts with the semiconductor. The semiconductor is a single crystal, advantageously of silicon, characterized by a concentration of shallow impurity levels (typically donors) which is less than



the concentration of deep impurity levels ("traps"). A three-terminal switch can be made therefrom in a planar semiconductor structure, by further providing the structure with a control electrode which is located between the ohmic contacts and which is insulated from the semiconductor.

3,654,532

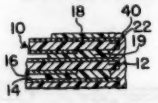
MULTILAYER PLASTIC CHIP CAPACITOR

Charles C. Rayburn, Falls Curch, Va., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed May 25, 1970, Ser. No. 40,012

Int. Cl. H01g *1/14*

U.S. Cl. 317—258 **2 Claims**



Multiplayer chip capacitors and method of making whereby two-side metalized plastic strip material is wound in annular hoop form and opposite sides of hoop are pressed together to bond layers together. The metalized plastic strip is pre-coated with a very thin coating of a heat sealable material such as plastic which functions as a capacitor dielectric and also as a bonding agent. The marginal edges of the pressed hoop are sprayed with molten aluminum at high velocity which makes contact with the edges of the thin metalized layers and penetrates the plastic coating to also provide contact with marginal portions of the metalized electrode coatings. The flattened hoop is then sliced into a plurality of capacitors which can be made to have any value desired over a large range by cutting them to a particular width. Values can be controlled very precisely by first cutting and testing one capacitor and then altering the width of later cut capacitors relative to the tested one. The uncut capacitors can be stored and cut to value as needed.

3,654,533

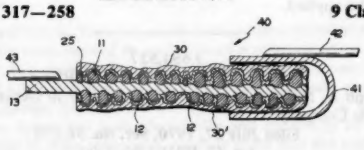
ELECTRICAL CAPACITOR

Paolo della Porta; Tiziano A. Giorgi; Bruno Kindl, and Mario Zucchinelli, all of Milan, Italy, assignors to S.A.E.S. Getters S.p.A., Milan, Italy

Continuation-in-part of application Ser. No. 527,906, Feb. 16, 1966, now abandoned. This application May 1, 1970, Ser. No. 33,828

Int. Cl. H01b *1/01*

U.S. Cl. 317—258 **9 Claims**



A capacitor comprising two capacitor plates and a dielectric between them. One plate is formed of an electrically con-

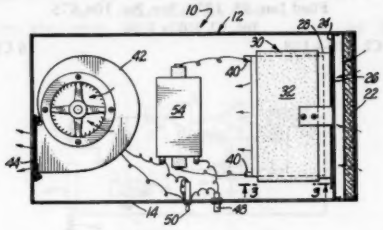
ductive substrate having electrically conductive particles partially embedded therein.

3,654,534

AIR NEUTRALIZATION

Ronald S. Fischer, 4636 N. Pick Road, El Monte, Calif.

Filed Feb. 9, 1971, Ser. No. 113,929
Int. Cl. A61l *1/00, 9/00*
U.S. Cl. 317—262 AE 6 Claims



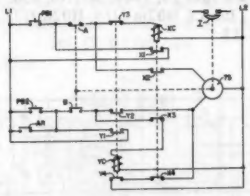
A gas such as common air may be treated so as to be electrically "neutralized" by passing the gas through the space between charged electrodes. These electrodes are changed by an AC current having a sinusiodal wave form which creates a field having an intensity in the space of at least 8 microamps per square inch. The gas being treated is passed through this space at a rate such that the gas is between the electrodes during a complete cycle of the AC current or during an even multiple of such a complete cycle. As the gas passes through the electrodes, various charges carried by or within the gas are removed from it.

3,654,535

MOTOR OPERATED CIRCUIT BREAKER CONTROL

Allen J. Hendry, and Alfred E. Maier, both of Beaver Falls, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 27, 1970, Ser. No. 23,198
Int. Cl. H02p *1/08*
U.S. Cl. 318—267 14 Claims



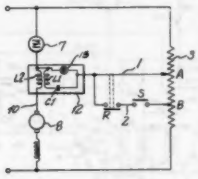
A motor operating device for reciprocating a circuit breaker handle structure between operating positions comprises a reversible motor, an opening relay, a closing relay and limit switch means operable to interrupt the motor circuit and to deenergize the energized relay. The limit switch means comprises a pair of mechanicaly interlocked molded-case circuit breakers with each of the circuit breakers being in series with a separate one of the reversible motor windings and in series with a separate one of the relay coils. Each of the relays is a four pole relay with one pole controlling the associated seal-in circuit; one pole controlling the associated motor energizing circuit; one pole providing an electrical interlock with a pole of the other relay; and one pole cooperating with a pole of the other relay to provide a dynamic braking circuit. The motor operated circuit breaker is also manually operable, and the control circuit is automatically prepared for an electrical operation to either the reset position or the closed position following a manual operation to the open position.

3,654,536

SYSTEM FOR STOPPING A SINGLE PHASE WOUND COMMUTATOR MOTOR AT A FIXED POSITION

Ataka Miura, Kodaira-shi, Japan, assignor to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed June 18, 1968, Ser. No. 738,054
Claims priority, application Japan, June 19, 1967, 42/38802
Int. Cl. H02p *3/02*
U.S. Cl. 318—466 3 Claims



In a phase control system of a motor using a semiconductor switching element such as a symmetrical semiconductor switching element or a semiconductor commutating control element, a series circuit of two switches is provided between a trigger circuit and a predetermined point of a resistor connected in parallel to a main circuit. A first switch will become ON when the current flowing to the motor is stopped, and a second switch is in the form of a drum by the motor so as to be made OFF at every rotation of the same. Thus, the motor is re-rotated at a low speed when the first switch becomes ON, and the motor is stopped at a predetermined position when the second switch is made OFF.

ERRATUM

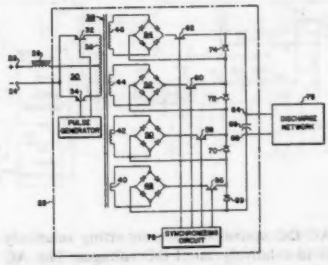
For Class 321—8 see:
Patent No. 3,654,540

3,654,537

HIGH EFFICIENCY POWER SUPPLY FOR CHARGING CAPACITORS IN STEPS

David W. Coffey, Westminster, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 29, 1970, Ser. No. 32,923
Int. Cl. H02m *3/24*
U.S. Cl. 320—1 5 Claims



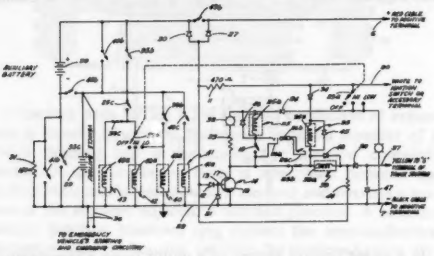
A system for direct current resonant charging of capacitors in which the size and weight of the power supply and an inductive choke for limiting surge currents can be materially

reduced by charging the capacitor in successive steps, each of a higher voltage level than the preceding step. This reduces the current surge from the supply during each step and also reduces the size of the required choke.

3,654,538
BATTERY BOOSTER CIRCUIT CONTAINING VOLTAGE SENSING MEANS

Joseph Gardberg, 585 W. 51st Street, Hialeah, Fla.

Filed Jan. 19, 1970, Ser. No. 3,866
Int. Cl. H02j 7/00
U.S. Cl. 320—7 **6 Claims**

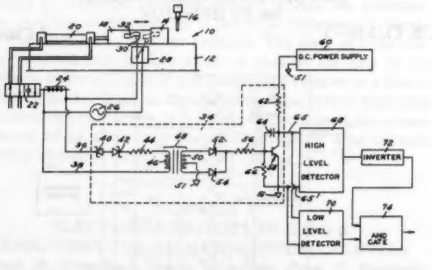


A battery booster circuit for use in conjunction with an emergence or road service vehicle for aiding stalled or disabled vehicles in which a first and a second battery carried by said road service vehicle are so connected that both batteries will be charging or discharging at any given time at substantially the same rate and in which current amplifying means are employed in a voltage sensing circuit to determine that correct polarity connections exist between the batteries of the service vehicle and between the booster charger system and the battery of the stalled or disabled vehicle, said voltage sensing means being operative even where the battery of the stalled or disable vehicle has no appreciable voltage.

3,654,539
AC-DC CONVERTER

Earl J. Schnur, Lake Orion, and Angelo N. Vinch, Warren, both of Mich., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 11, 1972, Ser. No. 114,502
Int. Cl. H02m 7/00; H03k 5/20
U.S. Cl. 321—8 R **18 Claims**

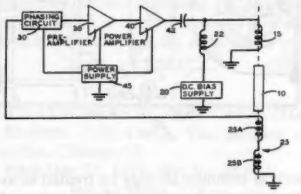


An AC-DC converter for converting relatively large AC voltages to relatively small DC voltages. The AC input circuitry of the converter comprises two zener diodes back-to-back in series with a resistor and the primary of a transformer. The circuitry in the transformer secondary supplies spaced pulses of similar polarity to a transistor circuit. The transistor circuit includes a capacitor and resistors whose values may be varied to vary the response of the converter. The output of the converter is taken across the collector-emitter of the transistor.

3,654,540
MAGNETOSTRICTIVE DRIVE CIRCUIT FEEDBACK COIL

William M. Honig, New York; Richard H. Paschke, Medford, and Jacob Haggag, Howard Beach, all of N.Y., assignors to Cavitron Corporation, Long Island City, N.Y.

Filed Jan. 15, 1971, Ser. No. 106,675
Int. Cl. H01v 9/00
U.S. Cl. 318—118 **6 Claims**

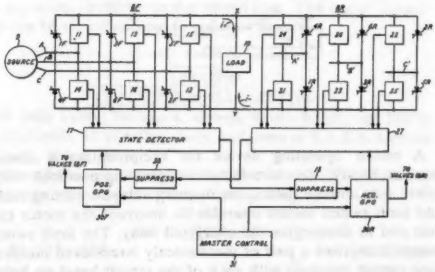


A feedback coil is placed in surrounding relation to a magnetostrictive member which is vibrating under the influence of a drive coil being energized by a power amplifier. Ideally, the voltage induced in the feedback coil should be proportional only to the vibrational amplitude of the magnetostrictive member. The induced voltage is fed back to the input of the power amplifier insuring that the member is vibrating at one of its resonant frequencies. The feedback coil is designed so that there is no transformer coupling between the feedback and drive coils. The feedback coil can be positioned along the length of the device in one of two ways, so as to maximize the induced voltage. Each way relies on a different magnetostrictive effect.

3,654,541
THYRISTOR STATE SENSOR

Fred W. Kelley, Jr., Media, Pa., and Georges R. E. Lezan, Cherry Hill, N.J., assignors to General Electric Company

Filed June 26, 1969, Ser. No. 836,765
Int. Cl. H02m 1/18; H02p 1/22
U.S. Cl. 321—13 **15 Claims**



To sense when a thyristor is conducting, voltage detecting means is connected in parallel with the thyristor for emitting an indicating signal whenever the instantaneous magnitude of voltage across the thyristor exceeds a predetermined threshold level which is higher than the voltage drop across the thyristor when conducting, and logic means is provided for producing a predetermined output signal in response to

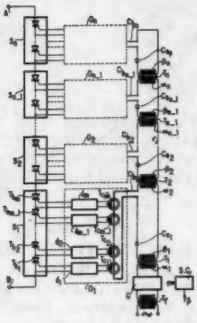
the absence of said indicating signal and, concurrently, the act of either triggering the thyristor or producing the output signal.

3,654,542

DEVICE FOR SIMULTANEOUSLY CONTROLLING INTERCONNECT SEMICONDUCTOR ARRANGEMENTS

Jean Chaupit, Fontenay-Aux-Roses, France, assignor to Compagnie Generale D'Electricite, Paris, France

Filed May 28, 1970, Ser. No. 41,301
Claims priority, application France, May 29, 1969, 6917613
Int. Cl. H02m 7/00
U.S. Cl. 321—27 R **15 Claims**



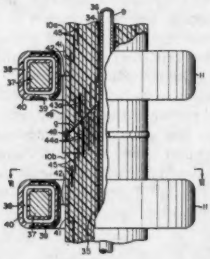
The control of semiconductor elements is ensured by a sinusoidal signal generator supplying control circuits adjusted to the frequency of the said generator. The control of a great number of elements in series is ensured by means of a cascade of transformers each having a secondary winding which is used as a signal source.

3,654,543

PULSE TRANSFORMER FOR FIRING THYRISTORS

Tokio Isogai; Eiichi Isikawa; Hisashi Yuza; Takasi Tahara; Takao Miyashita, and Norio Ikemoto, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 2, 1970, Ser. No. 86,028
Claims priority, application Japan, Nov. 5, 1969, 44/88096
Int. Cl. H02m 7/24
U.S. Cl. 321—27 R **14 Claims**



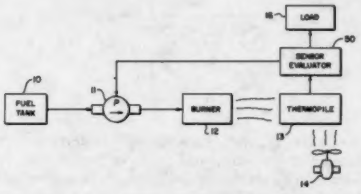
An improved structure of a pulse transformer for simultaneously firing all the gates of a multiplicity of series-connected or series- and parallel-connected thyristors as is the case with a converter in dc transmission equipment, having a greater insulation strength and a good resistivity to external shocks. Specifically, since the converter used at high tension renders the line voltage of each thyristor higher, a molded insulating cylinder is disposed between a primary conductor and secondary conductor units of the transformer, whereby potential distributions between the secondary transformer units and the insulating cylinder and between the secondary transformer units adjacent to one another can be improved by providing conductive layers embedded in the insulating cylinder, and the pulse transformer can be made of a dry tape and small in size.

3,654,544

THERMAL EQUILIBRIUM REGULATOR FOR A THERMOELECTRIC POWER SOURCE

Joseph P. Angello, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Army

Filed Jan. 13, 1970, Ser. No. 2,614
Int. Cl. H02n 3/00
U.S. Cl. 322—2 **5 Claims**



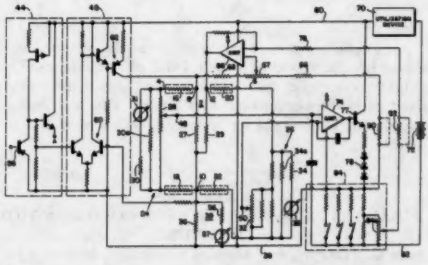
This invention relates to an automatic device used to control a desired amount of fuel injected into the combustion system of a thermoelectric power source. The electrical output capability of the thermopile is sensed and this signal is used to control the speed of an electrically driven fuel pump thereby maintaining the thermopile in a condition of thermal equilibrium, regardless of liquid fuel type used or load condition imposed.

3,654,545

SEMICONDUCTOR STRAIN GAUGE AMPLIFIER

Anthony M. Demark, Philadelphia, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 11, 1970, Ser. No. 62,868
Int. Cl. G01r 17/12
U.S. Cl. 323—75 B **7 Claims**



A semiconductor strain gauge amplifier apparatus having a temperature compensated bridge circuit for neutralizing the adverse affect of the ambient temperature variations upon the initial offset, sensitivity and span of the bridge, and thereby, providing temperature compensation over a wide range of operating temperatures.

3,654,546

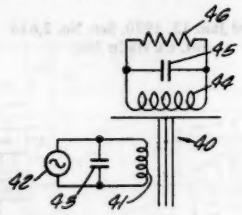
METHOD AND APPARATUS FOR REGULATING VOLTAGE BY UTILIZING THE STABLE OSCILLATION STATE OF A PARAMETRIC DEVICE

Leslie Kent Wanlass, Newport Beach, Calif., assignor to Wanlass Electric Company, Santa Ana, Calif.

Continuation-in-part of application Ser. No. 589,780, Oct. 26, 1966, now abandoned. This application May 5, 1969, Ser. No. 821,933

Int. Cl. G05f *1/32, 7/00*

U.S. Cl. 323—6 **26 Claims**



A method of regulating voltage by transferring energy from an unregulated voltage source to a parametric device to maintain it in its stable oscillating state. A method of filtering employing the same parametric principles is also disclosed, as are parametric devices in which a capacitor is coupled to an inductor to form a resonant circuit, the inductance of the inductor being varied electrically at twice the frequency to which the resonant circuit is tuned.

3,654,547

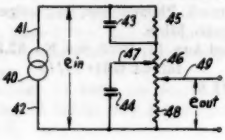
ALTERNATING CURRENT ATTENUATOR CIRCUIT

Loebe Julie, New York, N.Y., assignor to Julie Research Laboratories, Inc., New York, N.Y.

Filed July 22, 1970, Ser. No. 57,068

Int. Cl. G05f *3/04*

U.S. Cl. 323—74 **2 Claims**



An attenuator for alternating current is designed to provide a precise loss over a wide band of frequencies. The attenuator comprises two resistors, a voltage divider and two fixed capacitors connected in a circuit. The high frequency adjustment is obtained by changing the variable arm of the divider.

3,654,548

FINAL TEST ARRANGEMENT FOR COLOR CATHODE-RAY TUBE

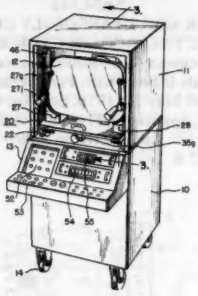
John G. Pecorari, and Michael S. Tamkin, both of Chicago, Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed Nov. 24, 1969, Ser. No. 879,013

Int. Cl. G01r *31/22*

U.S. Cl. 324—20 **5 Claims**

A test cart has an upper compartment into which a shadow mask color tube is loaded, being received in a movable workholder with the tube axis aligned with a horizontal reference axis. The workholder carries the tube into proper operating relation with respect to the usual accessories such as deflection yoke, convergence assembly, blue lateral, purity coil and tube socket. Various electrical systems are housed in the lower compartment of the cart, supplying energizing potentials and electrical signals necessary to test the tube in an environment closely simulating that of a color television receiver. A digital voltmeter is controlled by a function switching deck for convenient measurement of the operating characteristics of the tube under test.



3,654,549

APPARATUS FOR INDUCTIVELY MONITORING THE MOVEMENT OF A PISTON WITHIN A CYLINDER OF AN INJECTION MOLDING MACHINE

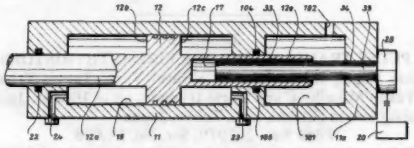
Ludwig Maurer, Emmendingen, Germany, and Jurg Von Ruti, Villars-sur-Glane, Switzerland, assignors to Maurer & Co., Zug, Switzerland

Filed Dec. 30, 1968, Ser. No. 787,803

Claims priority, application Germany, Dec. 30, 1967, P 16 23 787.9

Int. Cl. G01r *33/00*

U.S. Cl. 324—34 D **4 Claims**



A method and apparatus wherein the movement of a cylinder and piston, one with respect to the other, is measured. The measurement is carried out by way of a transducer which converts the relative movement into an electrical magnitude. The transducer includes a piston component fixed to the piston so as to move therewith, this piston being formed in the interior of the cylinder with an axial bore. The transducer also has a cylinder component which is maintained at a location which does not change with respect to the cylinder and which extends at least in part into the bore of the piston, this latter component of the transducer being coaxial with the piston.

3,654,550

KELVIN DOUBLE BRIDGE WITH ZENER DIODE FAILURE CIRCUIT

Robert C. Ward, Winston-Salem, N.C., assignor to Western Electric Company, Incorporated, New York, N.Y.

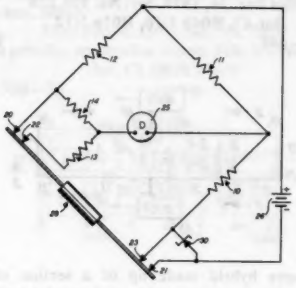
Filed Oct. 26, 1970, Ser. No. 84,035

Int. Cl. G01r *27/02*

U.S. Cl. 324—62 R **2 Claims**

In a Kelvin four-terminal double bridge circuit with a detector, an avalanche or Zener diode or similar voltage

responsive device is connected across a current terminal to an adjoining voltage terminal. The avalanche diode has a breakdown voltage sufficiently smaller than the bridge supply



voltage to conduct and cause a definitive change in the detector if the current terminal fails to engage a resistance under test.

3,654,551

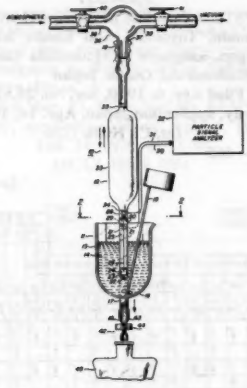
APERTURE VESSEL FOR FLUID-SUSPENSION PARTICLE ANALYZER

Dean A. Flinchbaugh, Bethlehem, Pa., assignor to Bethlehem Steel Corporation

Filed Mar. 4, 1970, Ser. No. 16,509

Int. Cl. G01n *27/00*

U.S. Cl. 324—71 CP **9 Claims**



Improved aperture vessel is provided for processing a sample of fluid-suspended particles through an aperture during the study of particle characteristics such as size distribution. Vessel may be used with commercially available particle analyzers such as the Coulter electronic, electro-optical and similar types of particle analyzing apparatus. Vessel construction permits a large fraction of sample suspension to be drawn from a sample beaker, through a particle aperture and an aperture chamber, and then into a calibrated volume-measuring bulb. The aperture chamber has an open bottom which, together with a series of associated valves, enables full recovery of the sample suspension fluid as well as both suspended and unsuspended particles after passing through the aperture. This aloquot is recovered in a transfer flask and recycled into the sample beaker. Since the study procedure is quantitative, unlimited numbers of data points are now obtainable on each sample. Greatly improved counting statistics are obtained on samples that contain very few particles of a given size.

3,654,552

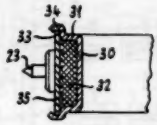
SMALL FRAMES FOR ROTARY OR MOVING COILS OF ELECTRICAL MEASURING INSTRUMENTS

Alfred Sauser, Solothurn, Switzerland, assignor to Sauser AG, Solothurn, Switzerland

Continuation of application Ser. No. 741,454, July 1, 1968, now abandoned. This application Aug. 5, 1970, Ser. No. 61,452

Int. Cl. G01r *1/00*

U.S. Cl. 324—154 R **10 Claims**



A small frame means for the moving coil of electrical measuring instruments, comprising a substantially rectangular-shaped coil winding body member formed of metal. A support member for spiral spring means and an indicator means is provided at the central region of two oppositely situated sides of the coil winding body member. Bearing needle means forming an axis of rotation cooperate with the support member. The coil winding body member and said support member cooperate with one another to enclose the coil windings, one of said members being substantially U-shaped and the other of said members being substantially flat. Furthermore, the invention contemplates the provision of means for providing an upset connection between the coil winding body member and the support member, with said support member being substantially centered at said coil winding body member.

3,654,553

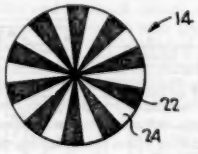
REMOTELY SENSING OPTICAL TACHOMETER

Donald J. Mary, Hyattsville, and Harry J. Davis, Wheaton, both of Md., assignors to The United States of America as represented by the Secretary of the Army

Filed July 1, 1970, Ser. No. 51,461

Int. Cl. G01p *3/48*

U.S. Cl. 324—175 **12 Claims**



A remotely sensing optical tachometer for measuring the spin rate of a rotating member. The invention provides a simple optical system for measuring the spin and/or rate of change of spin, of, for example, an artillery shell or test projectile. The system provides a real-time readout of the spin rate, and requires no instrumentation aboard the projectile except for a small plane mirror that is attached obliquely to one end of the spinning projectile. The system directs a collimated beam of light that is reflected off the plane mirror back into the system where it traverses a stationary reticle

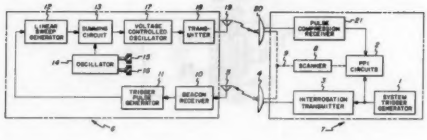
that has alternating transparent and opaque sectors thereon. The frequency with which the light passes through the transparent portions of the reticle provides a direct indication of the spin rate of the rotating member. The signal may be detected by a photo tube, amplified, and displayed on an oscilloscope, or recorded on magnetic tape, or be processed through a frequency-to-DC converter.

3,654,554

SECURE PULSE COMPRESSION CODING SYSTEM

Charles E. Cook, Farmingdale, N.Y., assignor to Sperry Rand Corporation, Great Neck, N.Y.

Filed Jan. 29, 1963, Ser. No. 255,718
Int. Cl. H04b *1/66*
U.S. Cl. 325—43 **13 Claims**



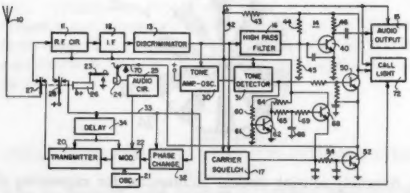
A pulse compression coding system comprising a transmitter providing first and second frequency swept signals of coextensive range and opposite sweep sense, each angle modulated in accordance with the amplitude and frequency of respective sinusoidal modulating signals for producing various carrier and sideband components, and a receiver including pulse compression filter means connected to the output of first and second mixers which respectively retain and invert the sweep sense of the received angle modulated signals whereby a pulse representative of each angle modulated component of the frequency swept signals is provided at the output of the filter means.

3,654,555

CARRIER AND TONE SQUELCH CIRCUIT WITH ELIMINATION OF NOISE AT END OF TRANSMISSION

George H. Ryan, Crystal Lake, and Ross W. Randolph, McHenry, both of Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Aug. 19, 1970, Ser. No. 65,089
Int. Cl. H04b *1/10*
U.S. Cl. 325—348 **8 Claims**



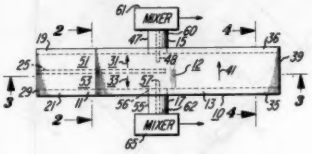
Squelch circuit for radio receiver operating in response to a carrier wave and in response to a coded tone, and wherein a reverse burst is used at the end of the tone to rapidly stop the resonant device. The circuit responding to the tone is coupled to the carrier squelch circuit and holds the same inoperative for a short period of time following the tone, to eliminate the noise burst which otherwise occurs.

3,654,556

MICROWAVE HYBRID COMPRISING TROUGH WAVEGUIDE AND BALANCED MIXER UTILIZING SAME

Cheng Paul Wen, Trenton, N.J., assignor to RCA Corporation

Filed Dec. 24, 1970, Ser. No. 101,278
Int. Cl. H04b *1/26;* **H01p** *5/12*
U.S. Cl. 325—446 **9 Claims**



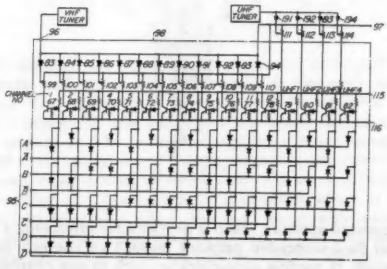
A microwave hybrid made up of a section of trough waveguide, rectangular waveguide and coaxial transmission lines is provided. The rectangular waveguide and the trough waveguide are joined end to end. The side walls of the trough waveguide form a continuous structure with the broad walls of the rectangular waveguide. The bottom wall of the trough waveguide forms a continuous structure with a narrow wall of the rectangular waveguide. Near the junction region of the trough waveguide and the rectangular section are coupled a pair of coaxial transmission lines with the inner conductor of one of the coaxial transmission lines extending through a first of the side walls of the trough waveguide and the inner conductor of the other coaxial transmission line extending through the second opposite side wall of the trough waveguide.

3,654,557

SYSTEM FOR SELECTING CHANNEL

Yoichi Sakamoto, Toyonaka, and Eisuke Ichinohe, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma-shi, Osaka, Japan

Filed Apr. 6, 1970, Ser. No. 25,628
Claims priority, application Japan, Apr. 14, 1969, 44/30692
Int. Cl. H04b *1/26*
U.S. Cl. 325—465 **11 Claims**



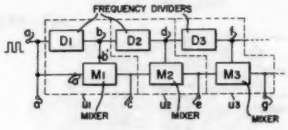
A system for selecting stations or channels for television broadcasting, wherein a signal from a binary signal generator is fed to a channel selection circuit for driving the same to select a channel circuit so as to obtain a corresponding DC voltage for impression on variable capacitance diodes to change the tuning condition. Mechanically operated parts such as mechanical switches are eliminated to facilitate fabrication of a totally electronic integrated circuit. Unnecessary channels may be automatically skipped, and the channel selection may be made in either a forward or reverse direction.

3,654,558

FREQUENCY DIVIDER CIRCUIT FOR PRODUCING A SUBSTANTIALLY SAWTOOTH WAVE

Norio Tomisawa, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shimzuoka-ken, Japan

Filed Feb. 2, 1970, Ser. No. 7,837
Claims priority, application Japan, Feb. 3, 1969, 44/8067
Int. Cl. H03k *21/00*
U.S. Cl. 328—35 3 Claims



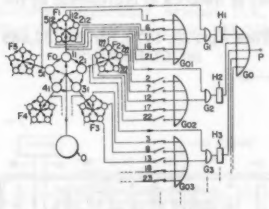
A tone signal source especially for electronic musical instruments having a plurality of output terminals for producing a nearly sawtooth wave output signal is composed of a plurality of frequency divider units each comprising a frequency divider circuit and a mixing circuit connected in such a manner that all of the frequency divider circuits included in the frequency dividing units are connected in cascade, and one of the input terminals of each mixing circuit is connected to an input terminal of the circuit or to the output terminal of the preceding mixing circuit, and the other input terminal thereof is connected to the output of the frequency divider circuit belonging to the output of the frequency divider circuit belonging to the same frequency dividing unit, so that a plurality of the output signals can be obtained from the output terminals of these mixing circuits.

3,654,559

WORD GENERATING APPARATUS

Kazuo Yamane, Tokyo, and Hiromi Maruyama, Asaka, both of Japan, assignors to Takeda Riken Industry Company Limited, Tokyo, Japan

Filed Mar. 31, 1970, Ser. No. 24,209
Claims priority, application Japan, Apr. 1, 1969, 44/24392; Feb. 24, 1970, 45/15185
Int. Cl. H03k *3/64*
U.S. Cl. 328—61 2 Claims



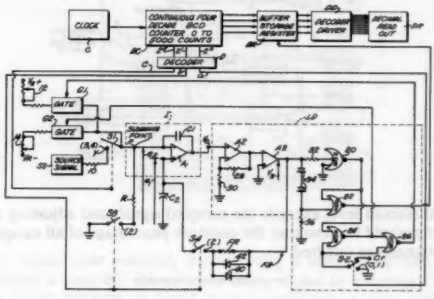
This disclosure includes embodiments of apparatus for generating patterns of pulses comprising fixed or random series of pulses of predetermined bit lengths using a first register driven by pulses at the pattern clock rate, and the stages of the first register being coupled each to drive at least one other register having multiple output stages, and the latter being coupled to gating means to be gated with outputs from said first register. Random series of pulse patterns are generated in an embodiment including switching of the outputs of the other registers to the gating means, which switching is controlled by random signals generated in another register.

3,654,560

DRIFT COMPENSATED CIRCUIT

Pieter G. Cath, Cleveland, Ohio, and Maurice S. Klapfish, Cambridge, Mass., assignors to Keithley Instruments, Inc., Solon, Ohio

Filed June 26, 1970, Ser. No. 50,213
Int. Cl. G06g *7/18*; H03k *5/00*
U.S. Cl. 328—127 13 Claims



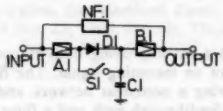
A drift compensated dual slope analog to digital converter is provided wherein an integrator is coupled to a signal level crossing detector. Circuitry is provided for compensating for offset drift voltages of both the integrator and signal level crossing detector.

3,654,561

APPARATUS FOR MEASURING A PEAK VALUE AND A PEAK-TO-PEAK VALUE OF AN ELECTRICAL SIGNAL

Mitsuru Egawa, and Tomoteru Takano, both of Tokyo, Japan, assignors to Tokyo Seimitsu Co., Ltd., Tokyo, Japan

Filed Mar. 10, 1970, Ser. No. 18,037
Int. Cl. H03k *17/00*
U.S. Cl. 328—151 8 Claims



Apparatus for measuring a peak value and a peak-to-peak value of an electrical signal provides one or a plurality of high gain DC amplifier, diode, capacitor, high input impedance DC amplifier and feedback circuit, thereby carrying out a measurement extending over a wide amplitude range of an input measuring signal. By providing one or plural switching circuit, the operation of the measurement can be ceased and the measured peak value or peak-to-peak value can be stored in the capacitor to the next measuring period. Further, various modified apparatuses can measure a positive peak value, a negative peak value and a peak-to-peak value.

3,654,562

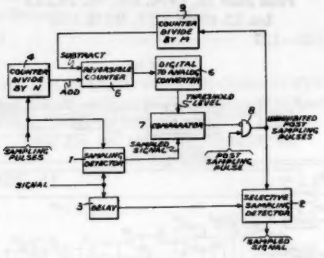
SELECTIVELY SAMPLING RECEIVED SIGNALS

Robert A. Reilly, Jr., North Caldwell; James P. Van Etten, Nutley, and Joseph Heinen, West Caldwell, all of N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed July 29, 1970, Ser. No. 59,231
Int. Cl. H03k *17/00*
U.S. Cl. 328—151 7 Claims

This is an apparatus and method for selecting a constant percentage of all sampled signals of a desired amplitude. This

is accomplished by sampling the signal, establishing an initial threshold level, comparing the sampled signal with the threshold level, selecting the sampled signal when the



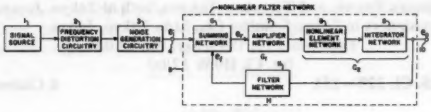
threshold level exceeds the sampled signal, and adjusting the threshold level so that the constant percentage of all sampled signals are selected.

3,654,563

ACTIVE FILTER CIRCUIT HAVING NONLINEAR PROPERTIES

Joseph P. Hesler, Liverpool; Robert J. McFadyen, and Fritz H. Schlereth, both of Syracuse, all of N.Y., assignors to General Electric Company

Filed Oct. 15, 1965, Ser. No. 496,372
Int. Cl. H03f 21/00
U.S. Cl. 328—167 **5 Claims**



An active filter for improving both frequency and noise characteristics of an incoming signal. The filter is a closed loop circuit having a nonlinear network and an integrating network in the feedthrough path and a filter network in the feedback path. In the presence of a rapidly changing input signal the circuit closed loop response peaks over a relatively wide band of higher frequencies for accepting high frequency components of the input signal, while in the presence of noise the closed loop response exhibits a restricted bandwidth.

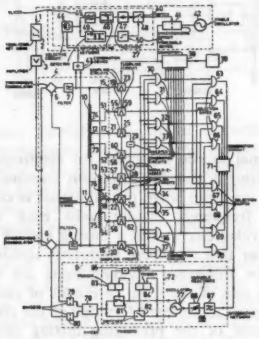
3,654,564

RECEIVER INCLUDING AN N-PHASE DEMODULATOR

Feliz Daniel Tisi, Zuerich, Switzerland, and Frank De Jager, Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed June 4, 1970, Ser. No. 43,341
Claims priority, application Netherlands, June 7, 1969, 6908714
Int. Cl. H03d 3/18
U.S. Cl. 329—122 **5 Claims**

The invention relates to a receiver for the reception of information pulse signals transmitted by means of *n*-phase modulation wherein the original information pulses coincide with different pulses from a series of equidistant clock pulses, the receiver including an *n*-phase demodulator which is provided with a plurality of parallel arranged synchronous demodulators which are fed by carriers having mutually different reference phases originating from a local carrier generator which is stabilised in phase on the carrier associated with the received signals, signal channels being connected to the outputs of the *n*-phase demodulator including sampling circuits controlled by a local clock pulse generator the output signal of which sampling circuits characterizes the phase of the received carrier relative to the relevant reference phase of the local carrier at the instants of the local clock pulses, the receiver furthermore being provided with combination circuits connected to the sampling circuits, which combination circuits characterize each of the *n*-possi-



ble phase sectors of the transmitted signals in a phase diagram by means of a separate combination of the outputs of the signal channels.

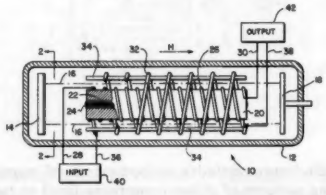
Such receivers are advantageously used in transmission systems which transmit an optimum quantity of information in the available frequency band. To stabilise the local carrier generator on the carrier at the transmitter end, the carrier frequency is transmitted, for example, in conventional manner from the transmitter to the receiver through a separate transmission path or with the aid of a pilot signal added to the information pulse signals to be transmitted.

3,654,565

TRAVELING WAVE TUBE

Louis J. Jasper, Jr., Neptune City, N.J., assignor to The United States of America as represented by the Secretary of the Army

Filed Apr. 28, 1970, Ser. No. 32,685
Int. Cl. H03f 3/58
U.S. Cl. 330—43 **11 Claims**



A traveling wave tube amplifier having an axial annular electron stream and a pair of counterwound axially aligned and radially spaced helices positioned intermediate the electron beam source and the collector electrode. The innermost helix is wound on the outer surface of a cylindrical ferrite which in turn is biased by means of a current-carrying wire loop passing through the axial bore of the ferrite cylinder. The RF input to the amplifier is at the electron source end and is applied to both counterwound coils, either in-phase or

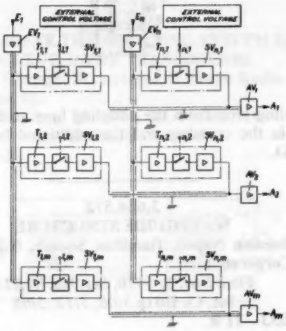
180° out-of-phase. The annular electron stream passes through the annular spacing between both helices and interacts with a prescribed mode, preferably the fundamental mode of RF wave energy propagated axially along the ferrite cylinder.

3,654,566

VIDEO CROSS BAR DISTRIBUTOR

Hans Weilhausen, and Georg S. Licht, both of Hamburg, Germany, assignors to GmbH Fernseh, Darmstadt, Germany

Filed Nov. 6, 1969, Ser. No. 874,601
Int. Cl. H03f 3/68
U.S. Cl. 330—124 10 Claims



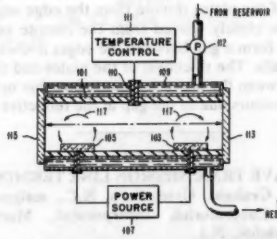
At the intersection of shielded input cross bars and shielded output cross bars variable gain amplifiers are provided whose gain is externally changeable from zero to a maximum. The variable gain amplifiers comprise a buffer stage designed to keep the input impedance constant regardless of gain changes, and a switching amplifier stage having the variable gain and having an output impedance which is low when the amplifier gain exceeds zero and high when the gain is zero. A mounting arrangement for mounting the components involved is also disclosed.

3,654,567

VAPOR DISCHARGE CELL

Rodney T. Hodgson, Somers, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1970, Ser. No. 103,240
Int. Cl. H01s 3/02
U.S. Cl. 331—94.5 7 Claims



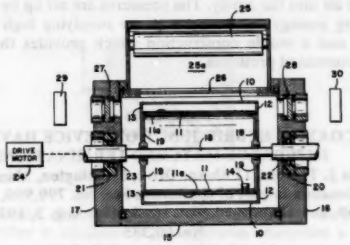
An electrical discharge cell having a plural wick heat pipe for preventing contamination without depleting the supply of vapor source material.

3,654,568

ROTATING LIQUID-COOLED LIQUID LASER CELL

Erhard J. Schimitschek, Garching, Munich, Germany, assignor to The United States of America as represented by the Secretary of the Navy

Filed Jan. 29, 1971, Ser. No. 110,904
Int. Cl. H01s 3/04, 3/09, 3/20
U.S. Cl. 331—94.5 6 Claims



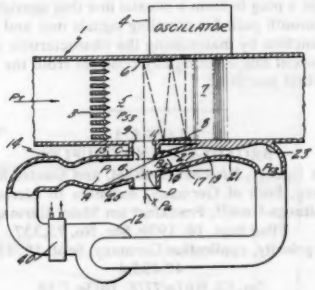
A liquid laser assembly for receiving a liquid laser composition is rotatably driven while being cooled by a surrounding liquid medium. A liquid laser composition is contained within the annular volume between inner and outer concentric cylinders and enclosing end walls. The rotatable assembly is mounted and supported within an enclosure and has a member extending through an enclosure wall for being driven by an appropriate drive means. A liquid cooling medium which surrounds the annular volume containing the liquid laser composition is circulated in and out of the enclosure through appropriate input and output ports for flow through a heat exchanger and circulating pump. The improved cooling of the liquid laser composition realized without circulating the laser composition itself significantly increases and enhances the efficiency of the laser operation.

3,654,569

AERODYNAMIC WINDOW

George F. Hausmann, Glastonbury, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Dec. 23, 1968, Ser. No. 786,485
Int. Cl. H01s 3/05, 3/08
U.S. Cl. 331—94.5 10 Claims



A gas dynamic laser emits an output beam from a low pressure region downstream of a nozzle section through which gases are expanded which contain the constituents necessary to obtain a lasing action. A gas dynamic laser employs the principles of kinetic relaxation of excited states of specific gas species to effect a population inversion of the excited states to obtain lasing action. An oscillator directs a low beam into said low pressure lasing region, and through an

optic arrangement the beam is amplified and directed out of an opening in the gas dynamic laser. Under normal circumstances the provision of such an opening would incur a flow of air from the ambient pressure to the low pressure within the laser cavity. The opening is connected to an aerodynamic window. The window has an unobstructed passage leading from the low pressure region of the gas dynamic laser to its exterior in which pressures are set up permitting passage of the laser beam, yet preventing or minimizing the low of exterior air into the cavity. The pressures are set up by an intersecting passageway having a pump supplying high pressure fluid and a nozzle construction which provides the proper predetermined pressures.

3,654,570

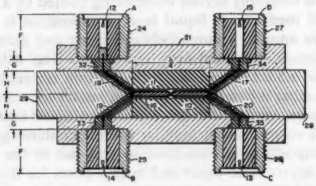
COAXIAL HYBRID JUNCTION DEVICE HAVING IMPEDANCE MATCHED TERMINATIONS

Calvin J. Thomas, 11 Sloane Drive, Framington, Mass.

Continuation-in-part of application Ser. No. 790,990, Jan. 14, 1969, now abandoned. This application Aug. 3, 1970, Ser. No. 60,385

Int. Cl. H01p *5/12;* **H03h** *7/38*

U.S. Cl. 333—11 **2 Claims**



A coaxial hybrid junction device employs an outer conductor through which extends a pair of center conductors which are side by side for a distance of approximately a quarter wavelength. The outer conductor is lined for the quarter wavelength distance by an insulative sleeve having a central longitudinal aperture in which the side by side center conductors are situated. The insulative sleeve is thick compared to the insulation between the center conductors. Coaxial connectors are mounted on the outer conductor. Each end of a center conductor is connected to the center pin of a different connector. A portion of the center conductor between the sleeve and the connector pin extends through a slanting channel in a plug to form a coaxial line that provides an electrically smooth path for coupling signals into and out of the hybrid junction by maintaining the characteristic impedance of the coaxial line substantially constant from the connector to the hybrid junction.

3,654,571

BROADBAND END COUPLING

Friedrich Rucker, Kirschenhardthof, and Gunter Morz, Ludwigsburg, both of Germany, assignors to Licentia-Patent-Verwaltungs-GmbH, Frankfurt am Main, Germany

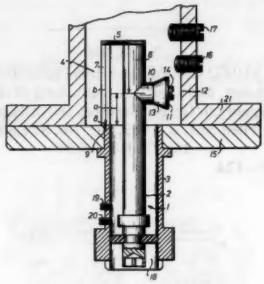
Filed Sept. 18, 1970, Ser. No. 73,337

Claims priority, application Germany, Sept. 19, 1969, P 19 47 495.4

Int. Cl. H01p *1/16;* **H03n** *7/38*

U.S. Cl. 333—21 R **8 Claims**

A broadband end coupling arrangement for coupling a coaxial transmission line into a waveguide. The coupling is achieved by providing the center conductor of the coaxial line, which extends axially into the waveguide, with a transverse coupling pin the face of which forms an adjustable capacitor with the oppositely disposed waveguide wall, and by providing at least one bar which is parallel to the center conductor and connected at one of its ends to the free end of the center conductor via a crossbar and at its other end to the outer conductor of the coaxial line so that the length of



the coupling loop from the coupling loop to the outer conductor via the crossbar and the additional bar is approximately ¾λ.

3,654,572

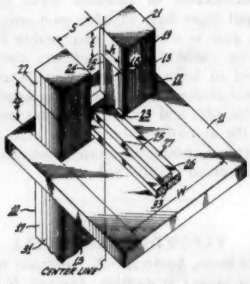
WAVEGUIDE STRUCTURE

Louis Sebastian Napoli, Hamilton Square, N.J., assignor to RCA Corporation

Filed Nov. 5, 1970, Ser. No. 87,211

Int. Cl. H01p *3/08, 3/12, 5/08*

U.S. Cl. 333—21 R **6 Claims**



A waveguide structure is described wherein a section of waveguide is effectively shorted at one end thereof by a pair of conductive plates. Each of the plates is adjacent to a narrow wall of the waveguide section and extends from broad wall to broad wall across the aperture of the waveguide. The edge of one of the plates remote from the edge adjacent to a narrow wall is closely spaced from the remote edge of the other plate to form a gap between the edges midway between the narrow walls. The thickness of the plates and the spacing of the gap between the plates is arranged so that no appreciable radiation occurs due to the gap at the reflective end.

3,654,573

MICROWAVE TRANSMISSION LINE TERMINATION

Bobby Eagle Graham, Greensboro, N.C., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights,, N.J.

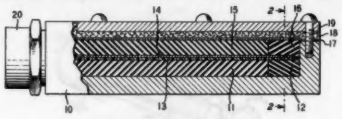
Filed June 29, 1970, Ser. No. 50,560

Int. Cl. H01p *1/26, 3/08*

U.S. Cl. 333—22 R **5 Claims**

A power dissipating termination for microwave transmission lines is disclosed. Nontapered, high-loss dielectric

material replaces the relatively lossless dielectric material immediately preceding the end of a two-conductor line. The



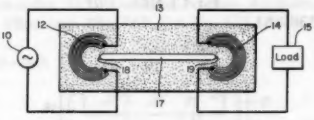
high-loss material has a dimensional configuration which results in a substantially nonreflective termination.

3,654,574

ACOUSTIC-WAVE TRANSMITTING SYSTEM HAVING CURVILINEAR TRANSDUCERS

Fleming Dias, Chicago, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Aug. 18, 1970, Ser. No. 64,710
Int. Cl. H03h *7/30, 9/30*
U.S. Cl. 333—30 **3 Claims**



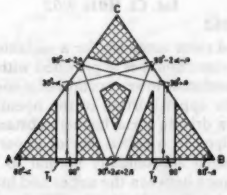
The system comprises a substrate capable of propagating acoustic surface waves. Disposed near opposite ends of the substrate are an input transducer that responds to an input signal for launching acoustic surface waves and an output transducer that responds to those waves for developing an output signal which is fed to a load. Extending lengthwise down the center of the wave-propagating surface is an acoustic wave guide that concentrates acoustic surface waves along a propagation path between the two transducers. Each of the transducers includes a pair of interleaved combs of conductive electrodes coupled piezoelectrically to the substrate. Adjacent teeth in the combs are spaced apart by one-half the acoustic wavelength and are curved concavely toward the adjacent end of the strip.

3,654,575

WAVE TRANSMISSION TIME DEVICE

Johannes Meyer Cluwen, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 2, 1969, Ser. No. 881,461
Claims priority, application Netherlands, Dec. 6, 1968, 6817492
Int. Cl. H03b *7/30, 9/30*
U.S. Cl. 333—30 **10 Claims**



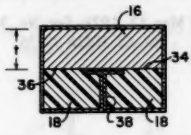
A wave transmission time device, for example an ultrasonic delay line, having a triangular delay body in order to avoid angular tolerances.

3,654,576

RECIPROCAL PHASE SHIFTER EXHIBITING NEGATIVE PHASE SHIFT

Daniel C. Buck, Hanover, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 25, 1969, Ser. No. 810,313
Int. Cl. H01p *1/18*
U.S. Cl. 333—31 A **6 Claims**



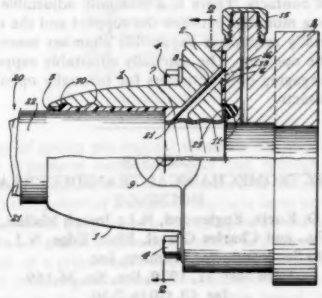
A miniature electromagnetic wave apparatus or reciprocal phase shifter is disclosed. The apparatus comprises a wave guide structure having a longitudinal axis and at least first and second parallel elongated conductive members. The wave guide structure is dimensioned so as to support propagation of electromagnetic wave energy in a direction along the longitudinal axis of the wave guide structure. The electromagnetic wave energy as supported in said wave guide structure has longitudinally and transversely extending r.f. magnetic field components. A thin elongated body of gyromagnetic material is disposed between the conductive members so as to be traversed by the transversely extending magnetic field components. Means are associated with the wave guide structure for establishing a given state of magnetization within the body of gyromagnetic material and longitudinally thereof so as to effect negative phase shift of the wave energy propagated through the phase shifter.

3,654,577

TERMINATION ARRANGEMENT FOR WAVEGUIDE

Georg Spinner, Munich; Juergen Luehring, Hannover, and Guenter Ahrens, Langenhagen, all of Germany, assignors to Spinner G.m.b.H., Elektrotechnische Fabrik and Kabel-und Metallwerke Gutehoffnung-shuette Aktiengesellschaft, Hannover, Germany

Filed Aug. 26, 1970, Ser. No. 67,087
Claims priority, application Germany, Aug. 29, 1969, P 19 43 885.8
Int. Cl. H01p *1/24*
U.S. Cl. 333—98 R **5 Claims**



A two-element waveguide terminator, wherein at the place where the flanged end of a waveguide is sandwiched between a flange of one terminator element and the other terminator element, there remains a hollow space between these elements. The one element is a sleeve disposed as a fitting over

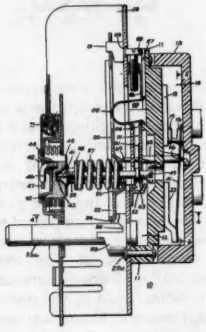
the waveguide end, but a hollow clearance space remains between sleeve and waveguide end. The one terminator element is provided with ducts interconnecting the two hollow spaces which are filled with a viscous elastic material, such as silicone rubber.

3,654,578

CONDITION RESPONSIVE SWITCH MECHANISM

Paige W. Thompson, Morrison, Ill., assignor to General Electric Company

Filed May 12, 1970, Ser. No. 36,624
Int. Cl. H01h *37/36*
U.S. Cl. 337—317 **6 Claims**



A condition responsive electric switch mechanism includes a switch having open and closed positions. A switch actuator is connected to the switch for moving it between its open and closed positions and a spring assembly is connected to the actuator for moving it between the switch open and closed positions. A thermally responsive mechanism, including a sealed expansible chamber assembly, is connected to the switch actuator for controlling movement between the switch open and closed positions. The sealed expansible chamber assembly is partially filled with liquid and partially filled with vapor so that the change in vapor volume between the switch open and closed positions is relatively large as compared to the total vapor volume. The mechanism may include two sets of spring contacts, each with its own actuator. A toggle mechanism is provided to operate one actuator. There is an operator to engage the toggle mechanism for movement of the toggle mechanism between open and closed positions of one set of contacts. There is a manually adjustable support and a spring mounted between the support and the operator. The thermally responsive expansible chamber assembly also engages the operator. The manually adjustable support has a position engaging both actuators for manually opening both sets of contacts.

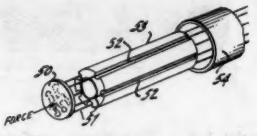
3,654,579

ELECTROMECHANICAL TRANSDUCERS AND HOUSINGS

Anthony D. Kurtz, Englewood, N.J.; Joseph Mallon, Philadelphia, Pa., and Charles Gravel, River Edge, N.J., assignors to Kulite Semiconductor Products, Inc.

Filed May 11, 1970, Ser. No. 36,169
Int. Cl. G01b *7/20*
U.S. Cl. 338—2 **11 Claims**

There is disclosed an electromechanical transducer of the type employing a silicon diaphragm. The transducer has terminal or contact areas deposited thereon by suitable metallization techniques. The contacts are located on a non-active area of the transducer and are routed by metallized conductors to piezo-resistive sensing elements diffused in the diaphragm within the active region thereof. The diaphragms are associated with suitable housing configurations employing slots or apertures in predetermined locations for accommodating wires or leads which are coupled to the contact



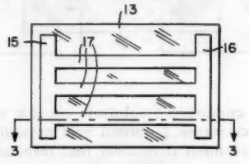
areas on the non-active area of the transducer, and are routed through the apertures to afford mechanical isolation of the leads to prevent them from adversely effecting the operating specifications of such transducers.

3,654,580

RESISTOR STRUCTURE

Risto Laisi, Amherst, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Mar. 14, 1969, Ser. No. 807,172
Int. Cl. H01c *3/02*
U.S. Cl. 338—61 **3 Claims**



A laminated resistor structure for low ohmic valued, high frequency and high power applications and a method for fabricating such a resistor structure. In the disclosed method, part of the resistive layer is removed from the laminated structure to form a plural branch pattern having a pair of spaced apart portions and a plurality of spaced apart elongated strips extending between the portions. The resistive layer pattern forms a parallel electrical connection of the resistive strips to provide not only low ohmic value but also a relatively large area of the laminated structure for power dissipation. By forming the resistive strips with straight line geometries, the inductance is minimal, thereby providing a high frequency capability.

3,654,581

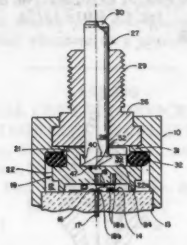
ROTOR AND SHAFT ASSEMBLY FOR VARIABLE RESISTOR

John J. Franz, Jr., Hacienda Heights, Calif., assignor to Beckman Instruments, Inc.

Filed Mar. 15, 1971, Ser. No. 124,162
Int. Cl. H01c *9/02*
U.S. Cl. 338—162 **8 Claims**

In a shaft and rotor assembly for a variable resistor device or the like the rotor member is provided with a slotted opening having an undercut lower portion of a width substantially greater than the upper portion of the opening. The shaft is provided with a driving head having substantially the shape of a parallelepiped in which a pair of upper and lower surfaces are arranged substantially normal to the axis of the shaft. The distance between the upper and lower parallel surfaces is slightly less than the depth of the lower portion of the slotted opening in the rotor and the sides of the head are arranged to mate substantially with the side walls of the slot in the rotor so that the shaft may be slid into the lower portion of the slot with the shank of the shaft extending through the

upper portion of the slot. The upper surface of the head abuts against the upper surface of the undercut lower portion of the slot thereby preventing axial movement of the head



and shaft with respect to the rotor. Lateral movement of the head with respect to the rotor is prevented by an extension from the lower surface of the head which fits into a mating opening formed on the lower surface of the slot.

3,654,582

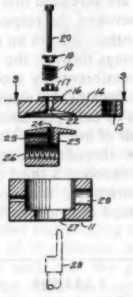
ROTATEABLE ELECTRIC CONTACT

Manuel Hernandez, 3137 Lancaster Avenue, Anaheim, Calif.

Filed Aug. 20, 1969, Ser. No. 851,658

Int. Cl. H01r *11/26*

U.S. Cl. 339—8 A **1 Claim**



A device for the connection of an output switch and an input lead for a battery, a plate portion of the device allowing for rotation of the upper portion. This device also contains a screw for securing the rotatable members.

3,654,583

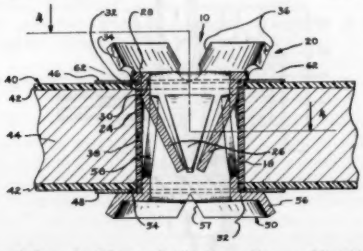
CIRCUIT BOARD EYELET

Lloyd Mancini, New Cumberland, Pa., assignor to Berg Electronics, Inc., New Cumberland, Pa.

Filed June 22, 1970, Ser. No. 48,302

Int. Cl. H01r *9/06, 11/22;* **H05k** *1/02*

U.S. Cl. 339—17 C **16 Claims**



A circuit board solder eyelet having a flange with a flat annular printed circuit contact surface at one end of the eyelet for establishing a flush heat transmitting contact with a printed circuit pad on the board. The body portion of the eyelet may be provided with a cylindrical insulating sheath.

3,654,584

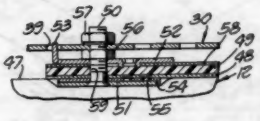
SERVICE LINE BRANCHOUT FACILITY FOR COMMUNICATION CABLES

George W. Gillemot, 2331 20th Street, Santa Monica, Calif., and John T. Thompson, 244 Loring Street, Los Angeles, Calif.

Filed Feb. 19, 1970, Ser. No. 12,821

Int. Cl. H01r *3/06*

U.S. Cl. 339—14 R **30 Claims**



A service line branchout facility for communication cables equipped with improved mechanical and electrical coupling means for rigidly interconnecting the cable sheath and shield to the adjacent end of the facility main frame. The coupling means are readily adaptive to widely varying conditions including a wide range of cable sizes and operating conditions affecting the spacing between the end of the cable sheath and the branchout facility. Wherever feasible the cable shield and sheath are clamped directly to the facility frame; if the sheath shrinks or is pulled away from the end of the facility, a metal adapter strip is interposed.

3,654,585

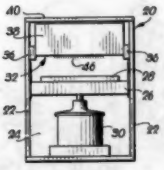
COORDINATE CONVERSION FOR THE TESTING OF PRINTED CIRCUIT BOARDS

Price D. Wickersham, Shawnee Mission, Kans., assignor to Brooks Research and Manufacturing, Inc., Kansas City, Mo.

Filed Mar. 11, 1970, Ser. No. 18,486

Int. Cl. H05k *1/02*

U.S. Cl. 339—17 M **7 Claims**



An array of spring pin contact elements are arranged in a matrix on a uniform rectangular grid and, through a coordinate conversion interface, provide access to the random-arranged contact points of a single or multiple layer printed circuit board for the purpose of conducting electrical tests. The interface is a transition plate constructed in accordance with the artwork of a given board and comprises a baseplate provided with contact pads on one side having the same random arrangement as the contact points of the board, and corresponding contact pads on the opposite side each positioned at an individual contact location having the same planar coordinates as a particular one of the spring pin contact elements. The corresponding pads are electrically interconnected through the baseplate. The board and the interface are supported on a shiftable platen with the random-arranged pads engaging the contact points, the platen being spaced

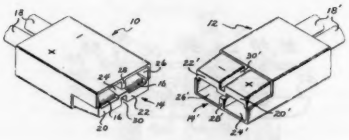
from and aligned with the spring pin elements such that, upon movement of the platen toward the spring pin elements, the pads on the opposite side of the interface are brought into engagement with the elements of like coordinates.

3,654,586

INDEXING MEANS FOR ELECTRICAL CONNECTORS

Edward D. Winkler, Reading, Mass., assignor to Anderson Power Products, Inc., Boston, Mass.

Filed Mar. 20, 1970, Ser. No. 21,279
Int. Cl. H01r *13/54; 25/04*
U.S. Cl. 339—49 R 7 Claims



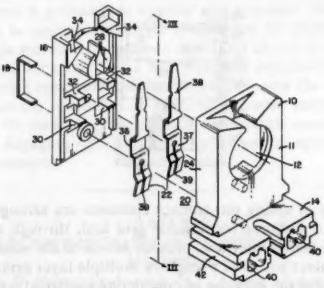
An indexing or keying system for electrical connectors adapted for longitudinal telescopic engagement with each other provides each connector with an indexing member having a predetermined facing configuration disposed at the connecting end thereof on one side of the centerline and a complementary indexing opening on the other side of the centerline having a facing configuration substantially identical to the facing configuration of the indexing member. By selecting unique complementary values for the facing dimensions of the indexing members and openings, the connectors may be indexed in accordance with any desired circuit parameter to prevent inadvertent joinder of dissimilar indexed connectors.

3,654,587

FLUORESCENT LAMPHOLDER OR THE LIKE

Emmett J. McLaughlin, Fairfield, Conn., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 15, 1970, Ser. No. 3,077
Int. Cl. H01r *33/08*
U.S. Cl. 339—53 R 5 Claims



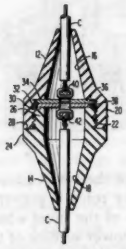
Contact members within a housing of a fluorescent lampholder are provided with a mounting portion secured in fixed position between the front and back members of the housing and a pin-contacting portion that is flat and parallel with a housing wall and not subject to twisting, the pin-contacting portion extending across a frontal opening for engaging an inserted lamp pin. The contact member has resilient means for permitting lateral motion parallel to the front wall but is constrained from any appreciable motion perpendicular to the front wall.

3,654,588

ELECTRICAL WIRE CONNECTOR

Fred N. Ruth, 7159 S. Missiondale, Tucson, Ariz.

Filed Feb. 5, 1970, Ser. No. 8,962
Int. Cl. H01r *13/54*
U.S. Cl. 339—89 R 15 Claims



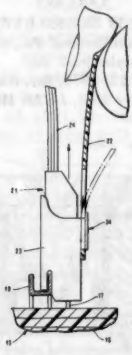
The connector includes a pair of electrical insulating housing elements having central openings and threadedly engageable one with the other. Each element is provided with an electrically conductive disc to which is secured a wire received within the associated opening, the disc butting a shoulder portion of the element. To effect an electrical connection, the elements are threaded one to the other with the discs being clamped between the respective shoulders in engagement with one another to form an electrical connection. In one form, the openings through the elements are tapered and the elements circumferentially scored at axially spaced positions whereby the ends of the elements can be removed to accommodate wires of enlarged diameter or larger gauge. In a further form, a pair of insulating elements having respective disc portions are threadedly engaged within a body which also threadedly receives a third element having a disc portion. In final securement, the first pair of discs are clamped against the third disc to provide an electrical connection therewith.

3,654,589

ELECTRICAL CONNECTOR

Edmund J. Di Stefano; Arthur E. Enderley, and Robert C. Hoffman, all of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

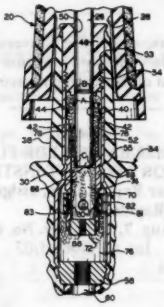
Filed Sept. 16, 1969, Ser. No. 858,476
Int. Cl. H01r *13/46*
U.S. Cl. 339—110 R 5 Claims



A cable assembly has a series of cables whose ends are joined to contacts in separate insulating housings. The hous-

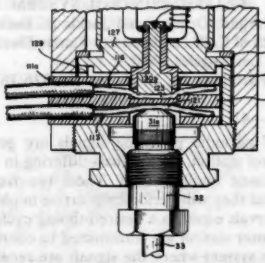
ings at each end of the assembly are ganged on holders. Each holder has a series of slots separably engaged with tabs on the associated housings. Each holder is flexible and has a portion which can be grasped by a person to allow the person to manipulate the assembly to join it with and disconnect it from mating contact elements on a printed circuit board.

3,654,590
ELECTRICAL CONTACT DEVICES FOR HIGH VOLTAGE ELECTRICAL SYSTEMS
Robert R. Brown, Bernardsville, N.J., assignor to Ameraca Esna Corporation, New York, N.Y.
Filed Dec. 30, 1969, Ser. No. 889,243
Int. Cl. H01r *13/52*
U.S. Cl. 339—111 **12 Claims**



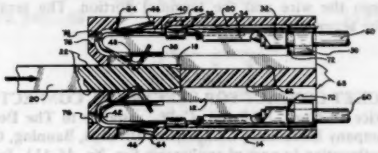
An electrical device in the form of an electrical connector for making a connection between complementary electrical contacts, shown in the form of a pin and a socket, under high voltage fault conditions, the device including a sleeve of arc-quenching material for guiding the pin into contact with the socket, the sleeve being axially spaced from the socket to provide a gap between the sleeve and the socket, and a metallic tubular member surrounding the gap and contacting the socket, the wall of the tubular member being radially spaced from the pin such that the gap has a longitudinal length no less than the order of magnitude of one-half the distance between the pin and socket at which an arc will be struck between the pin and the socket as the pin approaches the socket under high voltage fault conditions and a lateral width no less than the order of magnitude of one-half the same arc-strike distance.

3,654,591
ELECTRIC TERMINAL AND COUPLING
M. R. Jayaram, Long Beach, and Nickolas J. Sidaris, Cypress, both of Calif., assignors to Honeywell Inc., Minneapolis, Minn.
Filed July 2, 1970, Ser. No. 52,037
Int. Cl. H01v *1/10;* **H01r** *3/00*
U.S. Cl. 339—147 R **4 Claims**



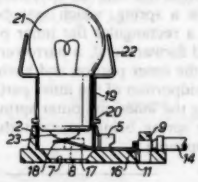
An electric terminal for connecting a high limit switch in series with a pilot-burner-heated thermocouple and a safety control energizable thereby. It embodies a wafer-shaped insulator with contact portions of lead wires located on opposite sides of the insulator. The terminal fits in an internally threaded socket of a housing for an electromagnet forming part of the control and is held therein by a connector nut for receiving the thermocouple's lead terminals.

3,654,592
ELECTRICAL CONNECTOR AND BLOCK
Michel M. Primorac, Middletown, Pa., assignor to Berg Electronics, Inc., New Cumberland, Pa.
Filed Sept. 21, 1970, Ser. No. 73,752
Int. Cl. H05k *1/07;* **H01r** *5/08*
U.S. Cl. 339—176 MP **12 Claims**



A circuit board connector block is provided with bi-metal terminals. Each terminal includes a body formed of a relatively maleable strip stock having a spring guard portion and a crimp barrel. A spring metal contact is confined within the guard with a portion extending into the crimp barrel so that when a bared wire is positioned in the barrel and the barrel is crimped, direct electrical connection is formed between the wire and the spring contact. Each terminal is snugly fitted within a cavity in an insulating body to form a connector block for circuit boards or the like.

3,654,593
LAMP HOLDER
Ian Bruce Page, Hemel Hempstead, and Alan Thompson, Harrow, Middlesex, both of England, assignors to AMP Incorporated, Harrisburg, Pa.
Filed Aug. 12, 1970, Ser. No. 63,141
Claims priority, application Great Britain, Sept. 30, 1969, 47,886/69
Int. Cl. H01r *33/46*
U.S. Cl. 339—188 R **1 Claim**

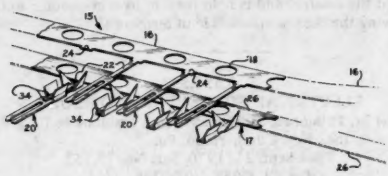


A base for a lamp socket, comprising a floor having an upstanding wall defining a lamp base receptacle, a portion of the wall having a slot to receive a forward part of an electrical contact, and a bridge spaced from the lamp socket receptacle supported on the floor for holding a rearward part of the electrical contact.

3,654,594
CRIMP TYPE TERMINAL
Fred C. Sitzler, Mechanicsburg, Pa., assignor to Berg Electronics, Inc., New Cumberland, Pa.
Filed Oct. 9, 1970, Ser. No. 79,525
Int. Cl. H01r *15/12*
U.S. Cl. 339—223 R **13 Claims**

A bi-metal crimp terminal having a terminal portion formed of high tensile strength spring material with a tail ex-

tending into a crimp barrel formed of relatively maleable strip stock such as brass so that when a bared conductor is positioned in the crimp barrel and the barrel is crimped



around the wire, a direct electrical connection is formed between the wire and the terminal portion. The terminals may be secured to a carrier strip.

3,654,595

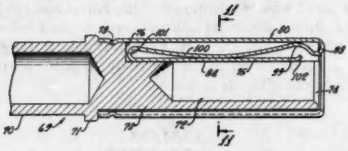
SOCKET CONTACT FOR ELECTRICAL CONNECTOR

Maurice D. Curr, Idyllwild, Calif., assignor to The Deutsch Company Electronics Components Division, Banning, Calif.

Continuation-in-part of application Ser. No. 45,411, June, 1970, now abandoned. This application Oct. 7, 1970, Ser. No. 78,761

Int. Cl. H01r *13/06*

U.S. Cl. 339—256 R **20 Claims**



A socket contact including an elongated cylindrical member having a cylindrical opening extending inwardly from the outer end thereof, a portion of the member being cut aay inwardly of the outer end, the cutaway portion intersecting the opening and providing parallel side edges along opposite sides of the opening and a flat surface rearwardly of the opening, a sleeve being positioned over the cylindrical member to enclose the cutaway portion and provide a space within which is a spring, which may be integral with the sleeve, having a rectangular flat inner portion with an outwardly inclined forward end, a narrower arcuate outer portion overlying the inner portion and having a convex surface engaging the midportion of the inner part, and a bent portion interconnecting the inner and outer spring portions, the bent portion of the spring being adjacent the flat surface rearwardly of the opening.

3,654,596

STORAGE TYPE ACOUSTIC IMAGE CONVERTER DEVICE AND ACOUSTIC VIEWING SYSTEM

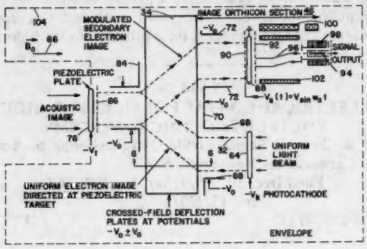
John M. Osepchuk, Concord, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Feb. 26, 1970, Ser. No. 14,375

Int. Cl. G01s *9/66*

U.S. Cl. 340—3 R **14 Claims**

An electron discharge device is provided for a system involving illumination by suitable sonic energy radiator means of any opaque, turbulent or dense medium and converting the returned acoustic signals into a video output signal for remote or direct display. Storage, as well as integration of acoustic signals through a process of correlation in a device having a unique crossed field electron beam deflection system is provided together with the signal impinging and generation means in an integral evacuated envelope. A non-scanning flood type electron beam continuously samples the



voltage on an acoustic-responsive conversion plate and yields a modulated secondary electron emission beam whose phase and amplitude is that of the impinging acoustic signals.

3,654,597

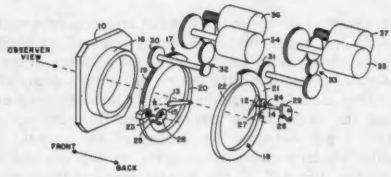
COMMAND BAR MECHANISM FOR FLIGHT DIRECTOR INDICATOR AIRCRAFT INSTRUMENT

Ronald E. Cox, Cedar Rapids, Iowa, assignor to Collins Radio Company, Cedar Rapids, Iowa

Filed Aug. 7, 1970, Ser. No. 61,953

Int. Cl. G08g *5/02*

U.S. Cl. 340—27 NA **8 Claims**



A compact positioning mechanism for an indicator assembly of the type comprising first and second bar members arranged in a V-like configuration and collectively defining a command plane which is both rotatable about and transversely displaceable with respect to a reference axis. A pair of ring members, each formed with a camming surface, carry the respective bar members on a cam follower pivotably mounted on one ring and in camming engagement with the cam surface on the other. Rotation of the command plane is achieved through like rotation of the two rings while displacement transverse of the reference axis is achieved by relative rotation between the two rings.

3,654,598

DIGITAL CYCLE SYSTEM COORDINATOR FOR TRAFFIC CONTROL SYSTEM

Daniel H. Morgan, Orange, and Jackie E. Herndon, Garden Grove, both of Calif., assignors to Tamar Electronics Industries, Inc., Los Angeles, Calif.

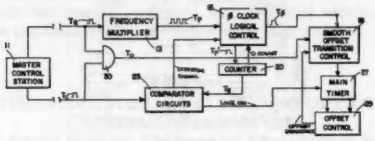
Filed May 20, 1969, Ser. No. 826,167

Int. Cl. G08g *1/07*

U.S. Cl. 340—41 **13 Claims**

A pair of periodic pulsating signals are generated at a master control station, such signals differing in frequency by a predetermined small amount. These two frequencies are chosen so that they will periodically arrive in phase with each other at intervals equal to a desired timing cycle. The signals from the master station are transmitted to coordinated intersections in a system where the signals are received by coordinators and digitally processed to generate a plurality of

clock pulses, each of said clock pulses representing a finite increment of the total timing cycle. These timing pulses as



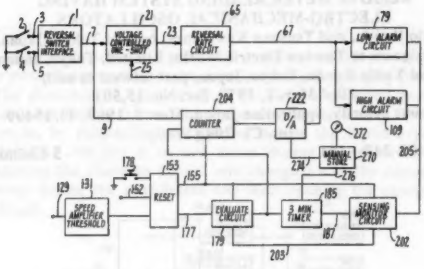
referred to the commencement of the timing cycle are utilized to synchronize the local controller with the master station and to provide various desired timing offsets.

3,654,599

VEHICLE STEERING REVERSAL RATE ALARM SYSTEM

Werner Sepper, Concord, Calif., assignor to Life Technology, Inc.

Filed Apr. 10, 1970, Ser. No. 27,410
Int. Cl. G08b *21/00*
U.S. Cl. 340—52 **12 Claims**



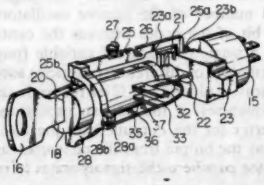
Pulses, generated by every reversal of a vehicle's steering wheel are counted during a fixed time period to determine a reversal rate when the vehicle exceeds a minimum speed. That rate is stored and a voltage proportional to the rate is used to control the pulse width of subsequent reversal pulses that are applied to a capacitor charging circuit having a long time constant. A high capacitor voltage activates a high reversal rate alarm and a low capacitor voltage activates a low reversal rate alarm.

3,654,600

STEERING LOCKING DEVICE

Yukio Yamamoto, Ohmiya, Japan, assignor to Nissan Motor Company, Limited, Yokahama and Kanto Seiki Company, Limited, Nissin-cho, Ohmiya, Japan

Filed Dec. 21, 1970, Ser. No. 99,958
Claims priority, application Japan, Dec. 29, 1969, 44/105176
Int. Cl. B60r *25/02*
U.S. Cl. 340—52 D **7 Claims**



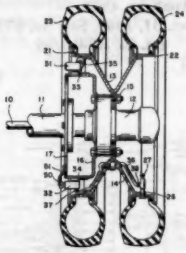
A steering locking device for an automotive steering system, whereby the steering shaft is locked when the key cylinder is held in its "lock" position and when the key is removed from the key cylinder and whereby a warning signal such as sound or light is produced when the vehicle door is opened with the steering shaft left unlocked and/or the key left inserted into the key cylinder. The warning signal is produced through operation of an electric switch mechanism which is compactly accommodated in the housing of the locking device.

3,654,601

VEHICLE TIRE PRESSURE WARNING SYSTEM

Robert V. Munson, and Patrick T. Thayer, both of San Antonio, Tex., assignors to Thayer Corporation, San Antonio, Tex.

Filed Mar. 10, 1970, Ser. No. 18,210
Int. Cl. G08b *21/00*
U.S. Cl. 340—58 **10 Claims**



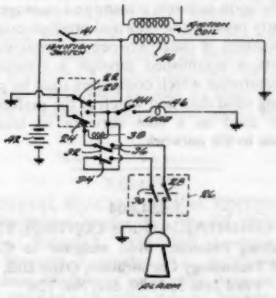
For detecting a reduction of pressure in the pneumatic tire of a vehicle. A magnet device is mounted for rotation with the vehicle wheel to pass in close proximity to a magnetically operated switch. The magnet device is responsive to the pressure within the tire to move the magnet in position to actuate the switch when the pressure falls below a predetermined value. The switch is connected in a circuit to produce a warning signal to the vehicle operator.

3,654,602

AUTOMOBILE ANTI-THEFT ALARM AND CONTROL UNIT

James A. Jones, 2814 York Avenue, Cleveland, Ohio

Filed Nov. 17, 1970, Ser. No. 90,297
Int. Cl. B60r *25/04*
U.S. Cl. 340—64 **3 Claims**



Apparatus for protecting a vehicle such as an automobile from theft and/or other improper use including a first double pole double throw switch, a relay having first and second normally open controlled switches and a second normally closed double pole, double throw switch. When the first switch is manually shifted to the protective position, the first

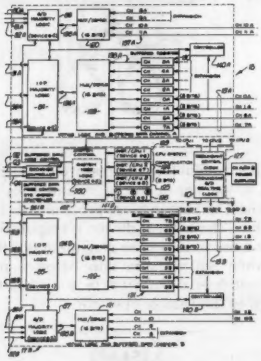
switch electrically connects the primary winding of the ignition coil or the like to ground so that the vehicle cannot be started and also electrically connects the vehicle battery to the relay via the vehicle devices which operate off the battery so that if any of these devices are used while the first switch is in the protective position the relay is activated. The activation of the relay causes a latching current path to be completed in parallel with the vehicle devices so that the relay remains activated even if all vehicle devices are thereafter shut off, and further causes a noisemaker such as the vehicle horn to be connected to the battery to sound an audio alarm. Once activated the relay remains activated until the first or second switch is manually opened.

3,654,603

COMMUNICATIONS EXCHANGE

William F. Gunning, Fullerton; John F. Wilson, Santa Ana, and Charles C. Bertram, Anaheim, all of Calif., assignors to Astrodata, Inc., Anaheim, Calif.

Filed Oct. 31, 1969, Ser. No. 873,015
Int. Cl. H04l *1/00*
U.S. Cl. 340—146.1 **4 Claims**



A communications exchange for automatically interconnecting subscriber lines and trunks employs a switching network operable to establish a large number of possible message transmission paths between subscriber terminators and trunk terminators; multiple computers are operable simultaneously upon network transmitted message processing data to similarly process the data and produce output signals; and communication of data between the switching network and computers is established through a system controller operable to determine which computers shall be preferred as communicating valid data and which of the preferred computers shall be used as a sole survivor to transmit valid processing data to the network.

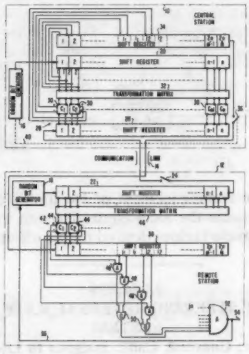
3,654,604

SECURE COMMUNICATIONS CONTROL SYSTEM

Paul A. Crafton, Potomac, Md., assignor to Constellation Science and Technology Corporation, Oxon Hill, Md.

Filed Jan. 5, 1970, Ser. No. 726
Int. Cl. G06f *11/00*; G08b *29/00*; H04l *15/24*
U.S. Cl. 340—147 R **10 Claims**

A system for generating secure command signals at a remote station, such as a branch bank, under the control of a central station, such as a main bank. Random words are independently generated at each station and transmitted to the other station. Both random words are compared at each station and the comparisons are ANDed at the remote station. Exact coincidence produces the command signal.

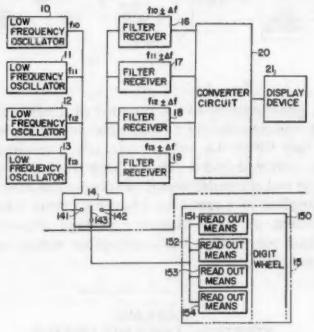


3,654,605

REMOTE METER READING SYSTEM HAVING ELECTRO-MECHANICAL OSCILLATORS

Yukio Honda, and Tsukasa Kawamura, both of Tokyo, Japan, assignors to Tamura Electric Works, Limited, Tokyo, Japan and Yukio Honda, Tokyo, Japan, part interest to each

Filed Mar. 2, 1970, Ser. No. 15,501
Claims priority, application Japan, Mar. 3, 1969, 44/15499
Int. Cl. H04q *9/00*
U.S. Cl. 340—151 **5 Claims**



In a remote reading system to read values displayed in a remote local office in a central office, the local office is provided with a digit wheel, a plurality of permanent magnets arranged on one side of the digit wheel in accordance with predetermined decimal — binary codes and a plurality of passive oscillators closely adjacent the digit wheel, a predetermined number of the passive oscillators being assigned to one bit of the codes whereas the central office is provided with a single oscillator of variable frequency or a plurality of oscillators of different frequencies assigned to the passive oscillators, a plurality of filter receivers responsive to oscillation frequencies of the passive oscillators, a binary-decimal converter for the outputs from the filter receivers, means to display the output from the converter, and a modulator. Each of the passive oscillators operates to resonate to a

frequency assigned thereto and sent from the central office when the passive oscillator comes to face one of the permanent magnets and the different oscillation frequencies are applied from the central office simultaneously to the passive oscillators in the local office through the modulator which connects the passive oscillators with the filter receivers to read in the central office the digits in the digit wheel.

3,654,606

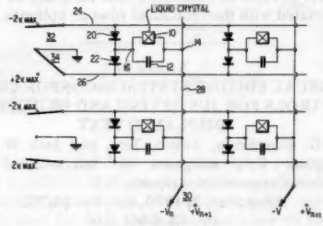
ALTERNATING VOLTAGE EXCITATION OF LIQUID CRYSTAL DISPLAY MATRIX

Frank Jerome Marlowe, Kingston, and Edward Oskar Nester, Hightstown, both of N.J., assignors to RCA Corporation

Filed Nov. 6, 1969, Ser. No. 874,527

Int. Cl. H04q *1/00, 3/00*

U.S. Cl. 340—166 **8 Claims**



A unidirectional electric field is applied to selected liquid crystal elements of a display matrix during one display frame. The direction of application of the field is reversed during the next display frame. The above may be achieved, for example, by connecting a capacitor across the liquid crystal element, charging it in one sense during one frame then opening the charging circuit, and charging it in the opposite sense during the next frame and then opening the charging circuit.

3,654,607

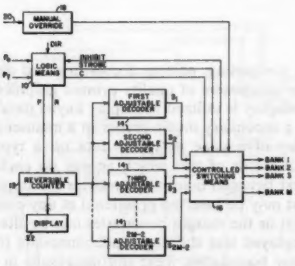
SIGNAL SEQUENCING SYSTEM

Andre Wavre, Monroeville, and Dean Santis, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 13, 1969, Ser. No. 798,914

Int. Cl. H04q *42*

U.S. Cl. 340—168 **13 Claims**



A system is disclosed for providing sequential control signals to an apparatus including a plurality of M banks of elements, wherein each bank comprises up to N elements and wherein the banks are moved in either a forward or reverse direction by incremental steps and wherein the groups within the banks are each moved incrementally in a cyclical manner. Such an apparatus could be the well known jack mechanism for moving the respective positions of a plurality of control rods operative with a reactor device. A reversible control signal counter is provided which counts the cumulative number of steps taken by all of the M banks. Adjustable decoding means provide selected signals at predetermined counter states. The selected signals are indicative of the incremental steps taken by the first and final group of elements during bank sequencing. Means are provided responsive to the selected signals to provide sequential bank signals. The disclosure includes means for insuring that the last element moved prior to a change in sequencing direction is the first to be moved in the opposite direction when a change of direction is desired. Means are also provided to insure that misalignment of the elements within the bank cannot occur

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3,654,608

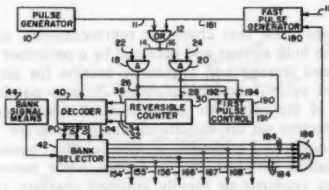
PULSE SEQUENCING SYSTEM

Andre Wavre, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 13, 1969, Ser. No. 798,913

Int. Cl. H04q

U.S. Cl. 340—168 **6 Claims**



It is herein disclosed a system for providing a cyclical sequence of equally spaced operation controlling pulses to elements or devices comprising a plurality of element banks. The number of banks of elements and the number of elements per bank may be varied easily within a given cycle duration and yet remain equally spaced in time regardless of the number of elements per bank. Further, the desired sequencing may be carried on in a forward or reverse direction. The above is carried out by providing a sufficient number of element operation controlling pulses to allow the selection among such pulses such that any number of elements per bank may be chosen for a predetermined operation up to a predetermined maximum number such that they are equally spaced in time. Bank signals are provided which are then gated by the element controlling pulses. The aforesaid is carried out by a bank selector matrix which comprises a plurality of terminals, from which selected terminals are connected to receive bank signals and the desired element pulses and also to appropriate gating means. The output from the gating means then comprises a cyclical sequence of pulses equally spaced in time which may be sent to those groups of elements located in banks for which bank signals have been provided.

3,654,609

PROPORTIONAL SPACING VISUAL EDITING SYSTEM

Robert G. Bluethman, Austin, Tex.; Paul E. Goldsberry, Lexington, Ky.; Robert L. McConnell, Lexington, Ky., and Jack W. Simpson, Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

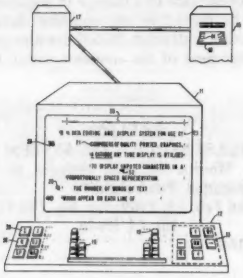
Filed Mar. 2, 1970, Ser. No. 15,791

Int. Cl. G06f *3/14*

U.S. Cl. 340—172.5 **12 Claims**

A data composing, editing, formatting and display system for use by composers of quality printed graphics. A cathode ray tube display is utilized to display inputed data characters

in a proportionally spaced representation. The number of words of text which appear on each line of displayed text are optimized in accordance with variable margin settings and the width values of the characters appearing on the line. Additional text may be inserted or deleted at any point in the displayed text without resultant loss of word definition, paragraph definition, word order, or line-margin relationship. Additional lines of text may be created or deleted between paragraphs of words as words are inserted or deleted in one of the



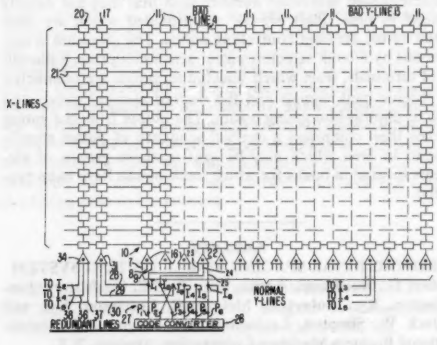
paragraphs. The text character representations are stored serially in bulk storage and accessed by a processor having a high speed storage and arithmetic section for display and line-word optimization calculations. A large parallel gating section of the processor and a control storage containing unique factors set the conditions which "program" the high speed storage and arithmetic section to effect necessary text manipulation between display frames while maintaining a real time response to rapidly initiated operator controlled functions.

3,654,610

USE OF FAULTY STORAGE CIRCUITS BY POSITION CODING

Wendell B. Sander, Los Altos, and Frank S. Greene, Jr., San Jose, both of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Sept. 28, 1970, Ser. No. 76,056
Int. Cl. G06f 5/02, 11/00
U.S. Cl. 340—172.5 **6 Claims**



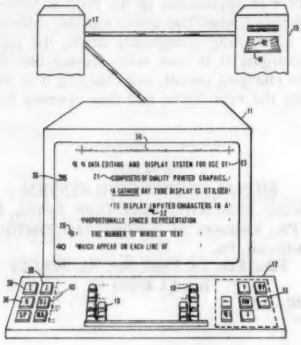
A memory system having an array of a predetermined number of storage cells, each for storing a single bit of binary information, arranged in rows and columns, the rows and columns each having binary addresses, the system including at least one redundant row of storage cells and one or more defective rows, or at least one redundant column of storage cells and one or more defective columns, or both. The contained cells of the redundant rows or columns are not required to make up the required number of storage cells. A code converter is embodied for converting the binary addresses of each of the rows and columns of the system to combinatorial addresses, each combinatorial address being associated with a row or column of the array, the maximum number of combinatorial addresses to which the binary addresses of all the rows or all the columns may be converted being at least one more than the maximum number of binary addresses of all the rows or all the columns, there being no binary address associated with the additional combinatorial addresses. A connection mechanism is included for connecting the code converter to the array of storage cells, the connection providing that the additional combinatorial addresses are associated with the defective rows or columns, and the combinatorial addresses with which the binary addresses of the defective rows or columns would normally be associated are associated with the redundant rows or columns.

3,654,611

VISUAL EDITING SYSTEM INCORPORATING CONTROLS FOR JUSTIFYING AND DEJUSTIFYING DISPLAYED TEXT

Robert G. Bluethman, Austin, Tex., and Jack W. Simpson, Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 2, 1970, Ser. No. 15,792
Int. Cl. G06f 3/14
U.S. Cl. 340—172.5 **14 Claims**



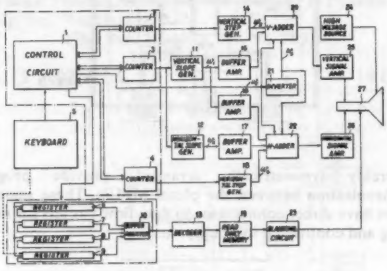
A data composing, editing, formatting and display system for use by composers of quality printed graphics. A cathode ray tube display is utilized to display keyed data and data inputed by a secondary media reader in a manner analogous to the display of a page of typed data on a typewriter. The number of words of text which appear on each line of displayed text between margin boundaries are optimized. Additional text may be inserted or deleted at any point in the displayed text or the margin boundaries can be altered resulting in the displayed text shifting to accommodate the additional test or new boundaries. Text shifting results in re-optimization of the display lines without resultant loss of word integrity or paragraph definition. Operator controls are effective to justify each line of displayed text by effecting extra spacing between text characters. The displayed justified text can then be outputed to a secondary media recorder or dejustified to facilitate further text and format modifications and thus maintain optimum word-line relationships.

3,654,612

DISPLAY SYSTEM USING A CATHODE-RAY TUBE

Katsuhiko Ohara, and Kazuchiyo Matsuzawa, both of Tokyo, Japan, assignors to Takachiho Koeki Kabushiki Kaisha, Komatsubara-machi, Kita-ku, Ohsaka-shi, Japan

Filed Mar. 25, 1970, Ser. No. 22,639
Claims priority, application Japan, Mar. 29, 1969, 44/23982
Int. Cl. G05f *5/00*; G05b *11/14*; G06k *15/20*
U.S. Cl. 340—172.5 5 Claims



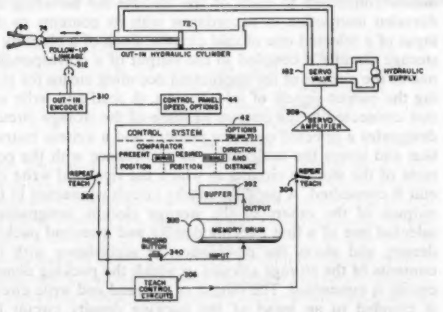
A display system for displaying information patterns on the screen of a cathode-ray tube obtained in a logical operation device, such as a calculator, where counters and registers are commonly used for both the logical operation of the logical operation device and the display operation of the system. The average DC values of the inputs to the vertical signal amplifier and the horizontal signal amplifier for the cathode-ray tube are maintained at stable values at both a period of the logical operation and a period of the display operation in order to eliminate the disturbance and fluctuation of the displayed pattern during the transition — an instant when the operation mode of the system is switched — from the logical operation to the display operation. Slope signals for displaying each digit are generated after a predetermined time from the start of the digit display time for a displayed unit-pattern.

3,654,613

PROGRAMMED MANIPULATOR APPARATUS WITH ARTIFICIAL END-OF-PROGRAM FACILITIES

Maurice J. Dunne, and George E. Munson, Jr., both of Newtown, Conn., assignors to Unimation, Inc., Bethel, Conn.

Filed Feb. 11, 1970, Ser. No. 10,379
Int. Cl. G06f *15/46*; B25j *9/00*
U.S. Cl. 340—172.5 15 Claims



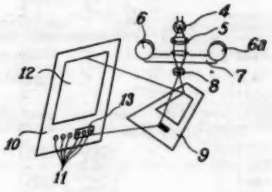
A programmed manipulator apparatus is provided with partial program repetition teaching facilities so that a predetermined portion of the total program may be repeated a selectable number of times after which the total program is performed. The point at which the partial program is to be repeated is employed to develop an artificial end-of-program signal which is employed to restart the total program. Counter means are provided for disabling the artificial end-of-program signal after a number of repetitions of the partial program. The manipulator apparatus is also arranged to cooperate with an externally produced artificial end-of-program signal which may be responsive to the presence or absence of a part carried by the manipulator arm, a characteristic such as the temperature of the part carried by the arm, or the like, and is employed to restart the total program if an undesired characteristic is sensed.

3,654,614

SYSTEM FOR AUTOMATICALLY SEARCHING OUT A DESIRED FRAME FROM A MICROFILM TRAVELLING ALONG A GUIDE PATH

Takeo Tano, Tokyo, Japan, assignor to Iwasaki Tsushinki Kabushiki Kaisha also k/a Iwatsu Electric Co., Ltd., Tokyo-to, Japan

Filed May 28, 1970, Ser. No. 41,328
Claims priority, application Japan, June 11, 1969, 44/45367
Int. Cl. G06f *15/40*
U.S. Cl. 340—172.5 2 Claims



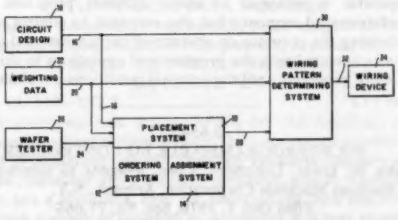
A system for automatically searching out a desired frame from a microfilm travelling along a guide path by counting the number of detected pulses generated in response to optical detection of each blip printed on the corresponding blank space of each frame of the microfilm is known. In accordance with a feature of this invention, detected pulses are generated from a group of photosensitive means so as to have directional information and sequential information. Moreover, additive counting-pulses and subtractive counting-pulses are generated in response to only the travelling direction of the microfilm.

3,654,615

ELEMENT PLACEMENT SYSTEM

Harlow Freitag, Lake Mohegan, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 1, 1965, Ser. No. 510,767
Int. Cl. G06f *7/00*
U.S. Cl. 340—172.5 20 Claims



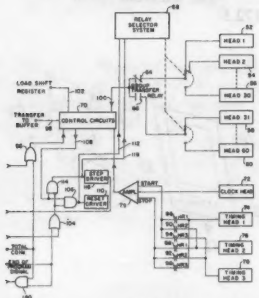
The disclosure describes a system for assigning a plurality of interrelated circuit elements to element positions in an

array of element positions on a circuit board. The system includes means for storing an indication of the interrelationship of the elements being assigned and the order in which the elements are to be assigned. Apparatus is provided for assigning the first element to be assigned to a selected position in the array, selecting candidate positions related in a predetermined manner to the position which has just had an element assigned to it; determining the best candidate position for the next element to be assigned and assigning the next element to be assigned to the position determined above; the system repeats the above three steps until all elements have been assigned.

3,654,616
PROGRAM SELECTION ARRANGEMENT FOR MANIPULATOR APPARATUS

Maurice J. Dunne, Newtown; Robert E. Correll, Middlebury, and Joseph Albert Picard, Jr., Ansonia, all of Conn., assignors to Unimation, Inc., Bethel, Conn.

Filed June 29, 1970, Ser. No. 50,441
Int. Cl. B25j *9/00;* **G06f** *15/46*
U.S. Cl. 340—172.5 **18 Claims**



Manipulator apparatus is provided wherein a number of multi-step programs for controlling movement of the manipulator arm in desired patterns of movement are available. Facilities are provided for automatically selecting any one of the programs in a random manner in respect to externally developed signals representing such programs. In a particular embodiment, the programs available control movement of the arm to perform different patterns of spot welding operations in accordance with automobile bodies randomly distributed on a production line conveyor. The control system also functions automatically to perform a spot welding operation at certain program steps in accordance with recorded spot weld control signals and without requiring a separate program step for a spot welding instruction, thereby substantially decreasing the number of program steps required to carry out a given pattern. Facilities are also provided for preventing double or multiple welds in response to a single position instruction or program step of the manipulator arm.

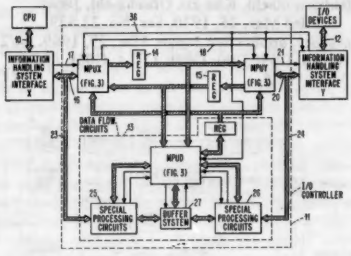
In accordance with a further embodiment, the manipulator apparatus is arranged to select different programs in a predetermined sequence but also responds to control signals indicating the presence or absence of certain external conditions associated with the programmed operations to skip one or more programs until the external conditions are changed.

3,654,617
MICROPROGRAMMABLE I/O CONTROLLER

John W. Irwin, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 1, 1970, Ser. No. 77,088
Int. Cl. G06f *9/12*
U.S. Cl. 340—172.5 **20 Claims**

A microprogrammable plural ALU (arithmetic-logic unit) controller utilizes task assignments for improving processing efficiencies. The ALU's are selected to be low-cost, low-capability devices. Each ALU is within one independent Micro Programmable Unit (MPU). Interconnection registers,

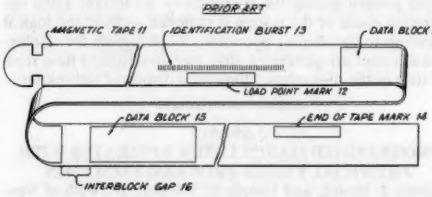


preferably symmetrically arranged, provide program synchronization between the plural MPU's. These same registers have direct connections to data flow circuits for monitoring and controlling their operation.

3,654,618
MAGNETIC TAPE UNIT CONTROL SYSTEM

Kaoru Kanda, Yokohama, and Tadahiro Kobayashi, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 23, 1970, Ser. No. 83,518
Claims priority, application Japan, Oct. 28, 1969, 44/86273; Nov. 26, 1969, 44/94885
Int. Cl. G06f *3/06;* **G06k** *19/08*
U.S. Cl. 340—172.5 **6 Claims**



Instruction decoding means decodes a received instruction. The instruction decoding means comprises a plurality of circuits each representing a different instruction and each providing an output signal at its output and decoding control means connected to each of the circuits for directing the decoded instruction in accordance with its contents to the input of a selected one of said circuits. Each of a plurality of storage circuits is coupled to the output of a corresponding one of the circuits of the instruction decoding means for storing the output signals of said circuits. A read and write circuit connected to the outputs of some of the storage circuits designates a selected one of a readout and a writein instruction and stores the designation in accordance with the contents of the storage circuits to which the read and write circuit is connected. A packing density circuit connected to the outputs of the others of the storage circuits designates a selected one of a first packing density and a second packing density and stores the designation in accordance with the contents of the storage circuits to which the packing density circuit is connected. The output of the read and write circuit is coupled to an input of the packing density circuit for designating the second packing density in the packing density circuit when the read and write circuit designates a readout. A packing density identification burst detecting means has an input coupled to a readout head of a magnetic tape for detecting the existence on the magnetic tape of a packing density identification burst. The output of the packing density

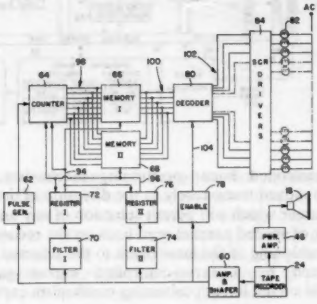
identification burst detecting means is coupled to an input of the packing density circuit for designating the first packing density in said packing density circuit when the packing density identification burst detecting means fails to detect a packing density identification burst in the magnetic tape.

3,654,619

AUDIO-VISUAL INSTRUCTIONAL SYSTEM WITH SYNCHRONIZED VISUAL AND AUDIO PRESENTATIONS

Abraham Tishman, Greenbelt, Md., assignor to Dynamic Typing, Inc., Washington, D.C.

Filed Dec. 20, 1968, Ser. No. 785,600
Int. Cl. G09b *13/02*
U.S. Cl. 340—172.5 **18 Claims**



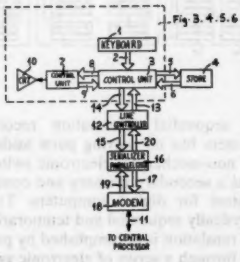
An audio-visual instructional system wherein the student or trainee is simultaneously subjected to synchronized visual and audio presentations for conditioning the trainee by utilizing both sensory perceptions. The system includes a visual display which is actuated by a memory device which is in turn actuated by a control signal of a signal reproducing means.

3,654,620

TERMINAL DEVICE FOR DATA TRANSMISSION WITH DISPLAY FACILITY AND MESSAGE FORMAT CONTROL

Antonio S. Bartocci, Ivrea, Italy, assignor to Ing. C. Olivetti & C.,S.p.A., Torino, Italy

Filed Oct. 21, 1969, Ser. No. 868,132
Claims priority, application Italy, Oct. 23, 1968, 53591 A/68
Int. Cl. G06f *3/14*
U.S. Cl. 340—172.5 **8 Claims**



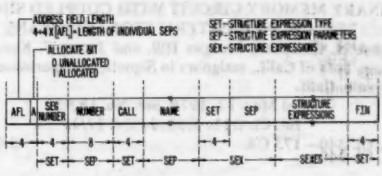
In a terminal device for the transmission of data, a display device is provided to display characters in a store contained in the terminal device. The position and format of displayed messages are adjustable by control of the location of storage of the data by means of a message format control. This latter is adapted to selectively generate a group of stop signals for defining a corresponding group of cells of the store; each one of said groups of cells corresponds to display positions defining a corresponding display format. The cells defined by the stop signals are decoded by decoder means and the characters are entered in them so that these characters are displayed in the positions of the display corresponding to the selected display format. Means are also provided which are operable for causing the characters following a predetermined flag signals to be shifted one step. Other means are provided for displacing the characters following said signal to be shifted to the next row of the display.

3,654,621

INFORMATION PROCESSING SYSTEM HAVING MEANS FOR DYNAMIC MEMORY ADDRESS PREPARATION

Robert V. Bock; Frederick Rehhausser, both of Malvern; Elmer Dean Earnest, Downingtown; Frederick H. Gerbstadt, Berwyn, and James A. White, West Chester, all of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Nov. 28, 1969, Ser. No. 880,537
Int. Cl. G06f *9/10*
U.S. Cl. 340—172.5 **14 Claims**



This disclosure relates to an information processing system having means to dynamically prepare memory addresses for any particular element in a field of variable length which field may reside in any portion of the systems storage. Each desired element is specified by a descriptor which contains all the information necessary for such specification and the system is provided with an evaluation section which is adapted to evaluate the descriptor to extract that information necessary to create the memory control word which is employed to address the system storage. Because of the dynamic nature of the descriptor evaluation or memory address preparation, absolute memory addresses need not be created until such time as they are required. Furthermore, the method and apparatus employed allow for the accessing of a hierarchy of nested structures within the system storage.

3,654,622

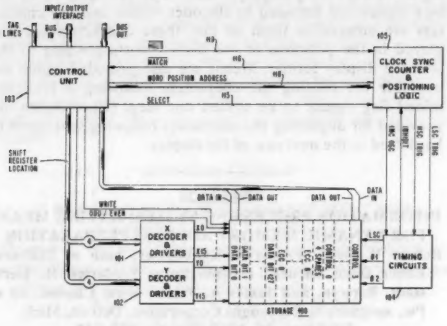
AUXILIARY STORAGE APPARATUS WITH CONTINUOUS DATA TRANSFER

William F. Beausoleil, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1969, Ser. No. 889,433
Int. Cl. G06f *7/34*
U.S. Cl. 340—172.5 **13 Claims**

An electronic bulk storage having the characteristics of a sequential access storage device. Data are stored parallel by word in a plurality of electronically rotatable memory elements selectable by a memory selection matrix. Each element has a feed-back loop for recirculating data and when selected, a group of elements at an address N is read in parallel a word at a time by electronically rotating data bits stored in the selected memory elements at an address. Controls are provided to select memory elements $N+1$ whenever elements

at address *N* are selected by the selection matrix. First data is read out of the elements at address *N* and then data is read



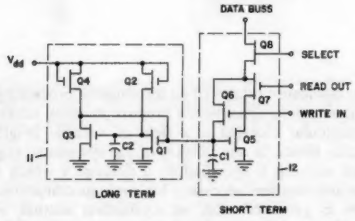
out of the elements at address *N*+1 without any time lost for reselection of memory elements.

3,654,623

BINARY MEMORY CIRCUIT WITH COUPLED SHORT TERM AND LONG TERM STORAGE MEANS

Eugene H. Campbell, Morgan Hill, and James F. Kane, San Jose, both of Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Filed Mar. 12, 1970, Ser. No. 18,952
Int. Cl. G11c *9/00, 11/24, 11/40*
U.S. Cl. 340—173 CA **6 Claims**



A binary memory circuit includes a short term memory having a capacitor coupled to a data bus by select and read and write field effect transistors. A long term memory element is also coupled to the capacitor and is in the form of a cross coupled inverter which includes gate-drain connected field effect transistors which act as load resistors in a pinch off mode for low power consumption. The switching time of the long term storage means is substantially longer than the rise time of the short term memory. The long term memory also restores or maintains any signal stored by the short term memory.

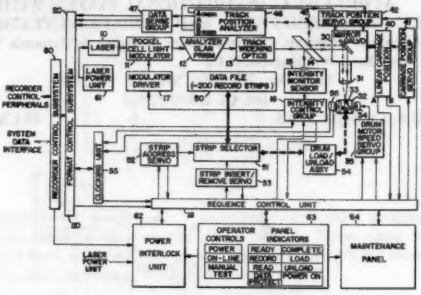
3,654,624

LASER RECORDING SYSTEM USING DRUM MOUNTED RECORD STRIPS

Carl H. Becker, Palo Alto; Harold R. Dell, Palo Alto; Ballard D. French, Palo Alto; Masao Hashiguchi, Mt. View; Keith E. McFarland, Woodside, and Herman Wong, Santa Clara, all of Calif., assignors to Precision Instrument Company, Palo Alto, Calif.

Filed Mar. 17, 1969, Ser. No. 807,553
Int. Cl. G11c *13/04;* **G01d** *15/14, 15/28*
U.S. Cl. 340—173 LM **16 Claims**

A laser recording system for scanning a modulated laser beam in spaced parallel lines across a flat elongated strip of energy absorbing material and for ablating minute regions from the material in a linear pattern representing digital bits according to the intensity of the modulating signal. The flat elongated record strip is wound around the surface of a drum during the recording and reproducing operations and the drum is rotated with respect to the laser beam. By means of a



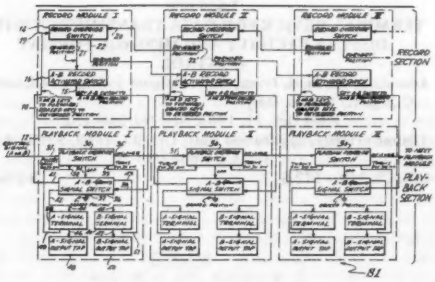
servo-controlled linear positioning mechanism, the laser beam is moved transversely to the direction of drum rotation in a manner which will permit selection of any one of a large number of spaced parallel scan lines on the record strip. The final positioning of the laser beam to the selected scan line is performed by a servo-controlled mirror galvanometer mounted on the linear positioning mechanism carriage.

3,654,625

RAPID SEQUENTIAL INFORMATION RECORD, STORAGE AND PLAYBACK SYSTEM

Ralph Silverman, 4326 Larchwood Avenue, Philadelphia, Pa.

Filed Aug. 6, 1969, Ser. No. 848,004
Int. Cl. G11c *7/00;* **G11b** *19/02*
U.S. Cl. 340—173 R **8 Claims**

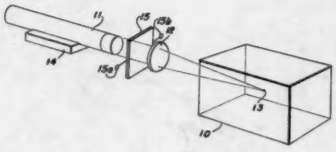


A rapid sequential information record, storage and playback system has no moving parts aside from electronically active non-mechanical electronic switches. The system may serve as a secondary memory and conclusion writing or readout system for digital computers. Translations occur between physically sequential and temporarily sequential sets of signals. Translation is accomplished by passage of an electric current through a series of electronic switches located in pairs of record and playback modules to change the electronic configurations of the electronic switches. In playback the modules that contain information are not emptied of information. Systems described employ record and playback modules operated in succession with or without feed back of signals to trigger successive operation in record and playback modes.

3,654,626
THREE-DIMENSIONAL STORAGE SYSTEM USING F-CENTERS

Myer Geller; Daniel E. Altman, both of San Diego; Thomas A. De Temple, El Cerrito, and Henry F. Taylor, San Diego, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Sept. 17, 1969, Ser. No. 858,693
Int. Cl. G11c *13/04*
U.S. Cl. 340—173 CC **16 Claims**



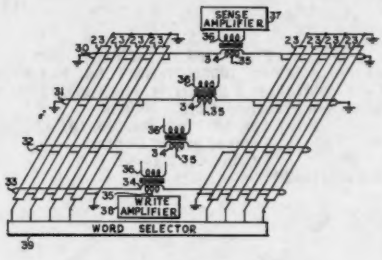
A high intensity beam of energy is sharply focused to produce F-center coloration at points within a suitable material. The sharply focused energy is arranged to be selectively directed at a plurality of a great many discrete points in three dimensional array within the material; the presence or lack of F-center coloration can be employed to record a "one" or "zero" in binary fashion. The recorded F-center coloration may be read out by an indicated attenuation of a light beam focused at each point of interest, or by photo-conductivity, or other suitable means. When desired, the recorded coloration points may be erased by irradiation with a suitable F-band beam or white light. The concept of the disclosed system permits the recording of binary information having a density of approximately 10^{10} bits per cubic centimeter, and extremely high speed electro-optical input and read-out.

3,654,627
PLATED WIRE MEMORY

Richard L. Snyder, New Smyrna Beach, Fla.

Filed June 30, 1970, Ser. No. 51,175
Int. Cl. G11c *11/14*
U.S. Cl. 340—174 PW **1 Claim**

A plated wire core memory array is described in which the core wires are divided into two sets which are placed on either side of word conductors. The flux emanating from one core during excitation passes through another core on the other side of the word conductors so that fluctuations in the

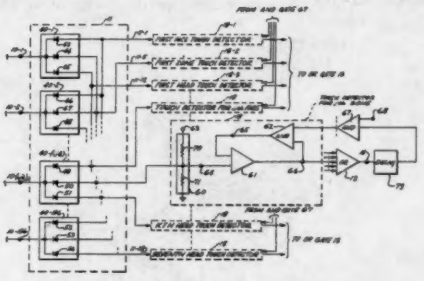


switching fields due to changes in the pattern of stored information, are reduced or suppressed.

3,654,628
MULTI-TRACK STORAGE SYSTEM HAVING A TOUCH CIRCUIT WITH INDIVIDUAL HEAD INDICATION

Donald M. Goodale, Thousand Oaks, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 4, 1970, Ser. No. 34,366
Int. Cl. G11b *5/40*
U.S. Cl. 340—174.1 B **24 Claims**



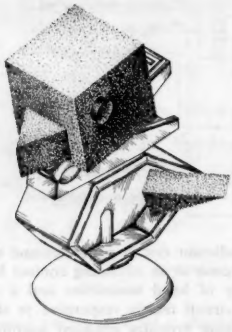
A touch indicator circuit generates and stores a warning signal in response to an offending contact between any one of a plurality of head assemblies and a movable record member. A circuit matrix responsive to signals generated upon a touching provides encoded warning signals which uniquely identify the particular head assembly which has made contact.

DESIGNS

APRIL 4, 1972

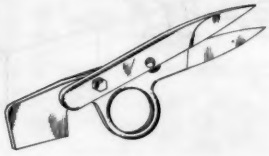
223,223
FRANKFURTER BUN
Theodore A. Corn, 10000 North Point, San Francisco, Calif. 94109, and Robert M. Harlick, 2330 Wexford, South San Francisco, Calif. 94080
Filed Apr. 14, 1969, Ser. No. 16,743
Term of patent 14 years
Int. Cl. D1—*01*
U.S. Cl. D1—15

223,224
HOLDER FOR SEWING MATERIAL OR THE LIKE
Margaret A. Wilbrecht, 400 Carlotta, Newport Beach, Calif. 92606
Filed July 29, 1970, Ser. No. 24,170
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D3—19



223,225
BEDSTEAD FOR CHILDREN
Ronald L. Magram, 9631 SW. 77th Ave., Apt. 208C, South Miami, Fla. 33143
Filed Oct. 5, 1970, Ser. No. 25,329
Term of patent 14 years
Int. Cl. D6—*01;* D21—*01*
U.S. Cl. D5—4

223,226
NIPPERS
Walter K. Fogg, 45 Kensington St., Feeding Hills, Mass. 01030
Filed Nov. 23, 1970, Ser. No. 26,120
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—57

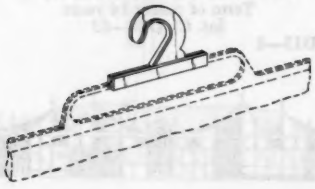


223,227
ELECTRICIAN'S COMBINED WIRE HOLDER AND HEAT ABSORBER, OR SIMILAR ARTICLE
Emanuel R. Archibald, 502 Buckeye St., Redwood City, Calif. 94063
Filed Jan. 15, 1971, Ser. No. 106,951
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—71

223,228
COMBINATION LOCK
Henry Padleckas, 815 N. Oak Ave, Oak Park, Ill. 60302, and Leonard Paulius, 6123 S. Bentley Ave., Clarendon Hills, Ill. 60514
Filed Aug. 19, 1970, Ser. No. 24,568
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—114

223,229
HOOK SUPPORT FOR CARRIER BAG HANDLE
Seymour Kamins, Oceanside, and Norman Rosenberg, Bayside, N.Y., assignors to CTP Industries Inc., Brooklyn, N.Y.
Original design application Oct. 9, 1968, Ser. No. 13,910. Divided and this application Oct. 6, 1969, Ser. No. 19,789
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—246

223,230
HOOK SUPPORT FOR CARRIER BAG HANDLE
Seymour Kamins, Oceanside, and Norman Rosenberg, Bayside, N.Y., assignors to CTP Industries Inc., Brooklyn, N.Y.
Original design application Oct. 9, 1968, Ser. No. 13,910. Divided and this application Oct. 6, 1969, Ser. No. 19,790
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—246

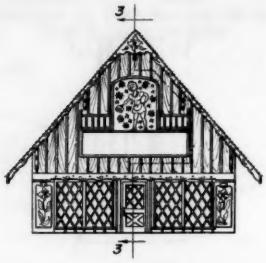


223,231
THREADED INSERT
Arthur C. Miller, P.O. Box 137, Chester Springs, Pa. 19425
Filed Sept. 21, 1970, Ser. No. 25,083
Term of patent 14 years
Int. Cl. D8—*10*
U.S. Cl. D8—272

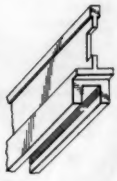
223,232
PACKAGING TRAY
William P. Jacobson, Rockford, Ill., assignor to Anderson Bros. Mfg. Co., Rockford, Ill.
Filed Jan. 4, 1971, Ser. No. 103,947
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—180

223,233
JEWELRY DISPLAY BOX
Bryan F. Commans, Overland Park, Kans., and Irene Irvin, Kansas City, Mo., assignors to The House of Commons, Inc., Kansas City, Mo.
Filed Oct. 12, 1970, Ser. No. 25,448
Term of patent 3½ years
Int. Cl. D9—*03*
U.S. Cl. D9—239

223,234
BUILDING FRONT
James A. Salmans, 511 N. Broadway, New Philadelphia, Ohio 44663
Filed Oct. 28, 1969, Ser. No. 19,759
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1



223,235
CEILING RUNNER
Howard A. Busby, 6361 Rancho Park Drive, San Diego, Calif. 92120, and Paul D. Dall, 800 S. Sunset, West Covina, Calif. 91790
Filed June 5, 1970, Ser. No. 23,333
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1



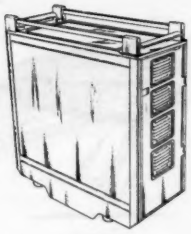
223,236
CONCRETE PILE
Shigeru Watanabe, Yasushi Ishihara, and Naoyoshi Kondo, Tokyo, Japan, assignors to Nippon Concrete Industries Company, Ltd., Tokyo, Japan
Filed July 9, 1970, Ser. No. 23,885
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1

223,237
CONCRETE PILE
Shigeru Watanabe and Koji Nunokawa, Tokyo, Japan, assignors to Nippon Concrete Industries Company, Ltd., Tokyo, Japan
Filed July 9, 1970, Ser. No. 23,886
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1

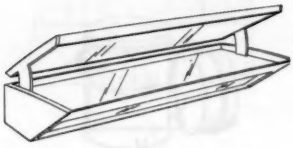
223,238
CONCRETE PILE
Shigeru Watanabe, Tokyo, Japan, assignor to Nippon Concrete Industries Company, Ltd., Tokyo, Japan
Filed July 9, 1970, Ser. No. 23,887
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1

223,239
BUILDING
Jack A. McMillan, Oklahoma City, Okla., assignor to Circustime, Inc., Oklahoma City, Okla.
Filed Dec. 14, 1970, Ser. No. 26,452
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1

223,240
SERVICE CART
Stuart I. Freedman, Los Angeles, Calif., assignor to Monogram Industries, Inc.
Filed July 10, 1970, Ser. No. 24,239
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D14—3

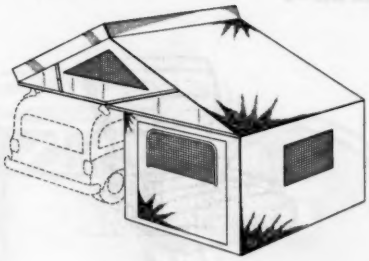


223,241
REAR VIEW MIRROR
Lynn Harold Hodge, 12618 Wyoming Ave., Detroit, Mich. 48238
Filed Aug. 17, 1970, Ser. No. 24,530
Term of patent 3½ years
Int. Cl. D12—*16*
U.S. Cl. D14—6

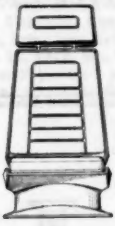


223,242
CONTROL HANDLE FOR INDUSTRIAL PALLET TRUCK
Roy Haynes, Danbury, England, assignor to Lansing Bagnall Limited, Basingstoke Hampshire, England
Filed Nov. 3, 1970, Ser. No. 25,800
Claims priority, application Great Britain May 4, 1970
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—6

223,243
CAR TOP CAMPER
Jimmy M. Lambert, 2108 Stonebridge Road, Dothan, Ga. 36301
Filed May 20, 1970, Ser. No. 23,065
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—27



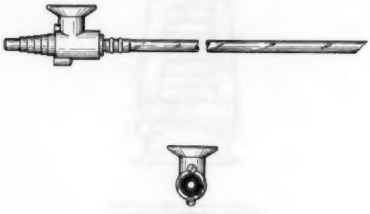
223,244
INFANT'S CAR SEAT
Robert Martin Prashker, Kingston, Pa., assignor to Jamy, Inc., Kingston, Pa.
Filed Apr. 6, 1970, Ser. No. 22,283
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D15—1



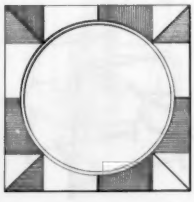
223,245
RECLINING CHAIR
Morton I. Thomas, Monroe, N.Y. (125 South St., Passaic, N.J. 07055)
Filed Nov. 16, 1970, Ser. No. 26,021
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D15—11

223,246
SEAT
Peter Geoffrey Mann, Glasgow, Scotland, and Iain Kilburn White, Melbourne, Victoria, Australia, assignors to Essoldo Furnishers Limited, Glasgow, Scotland
Filed Oct. 20, 1970, Ser. No. 25,566
Claims priority, application Great Britain Aug. 6, 1970
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D15—8

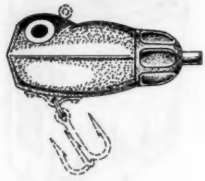
223,247
SUCTION CATHETER
David L. Brodsky, Providence, and Elliott J. Brodsky, East Greenwich, R.I., assignors to Superior Plastic Products Co., Providence, R.I.
Filed July 20, 1970, Ser. No. 24,033
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D16—1



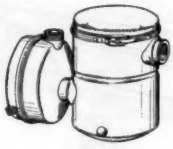
223,248
BUILDING BLOCK
Conrad L. Pickel, 500 SW, 16th St., Boynton Beach, Fla. 33435
Filed Sept. 30, 1970, Ser. No. 25,267
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D18—2



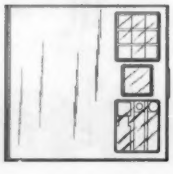
223,249
FISHING LURE
William D. Storm, P.O. Box 265, Norman, Okla. 73069
Filed May 27, 1970, Ser. No. 23,169
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27



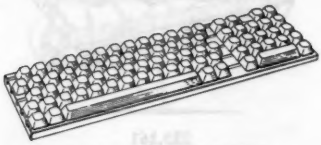
223,250
COMBINED SWIMMING POOL PUMP AND STRAINER
Harry M. Clinton, Northridge, Calif., assignor to Swimrite Manufacturing Co., Inc., Van Nuys, Calif.
Filed Aug. 3, 1970, Ser. No. 24,266
Term of patent 14 years
Int. Cl. D23—*01*; D15—*02*
U.S. Cl. D23—4



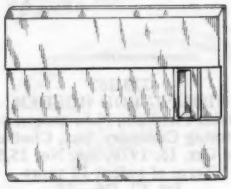
223,251
PACKAGED EDUCATIONAL ELECTRONIC TOY KIT
Jurgen Greubel, Eschenhahn Schone Aussicht, Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Germany
Filed Apr. 8, 1970, Ser. No. 22,334
Claims priority, application Germany Oct. 8, 1969
Term of patent 14 years
Int. Cl. D19—*08*
U.S. Cl. D25—1



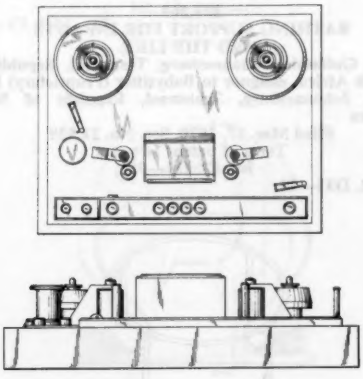
223,252
COMMUNICATION KEYBOARD
Allen G. Jacobson, Ramsey, N.J., assignor to Computer Transceiver Systems, Inc., Paramus, N.J.
Continuation-in-part of design application Ser. No. 16,968, Apr. 30, 1969, which is a continuation-in-part of design application Ser. No. 12,846, July 22, 1968. This application Apr. 23, 1970, Ser. No. 22,586
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5



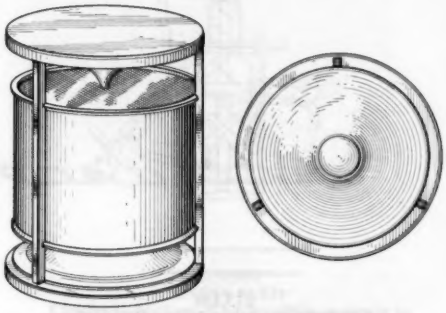
223,253
COVER PLATE FOR BOXES FOR COMPARTMENTS CONTAINING ELECTRICAL DEVICES
Giuseppe Zecca, Via Monte Tabor 16, Varese, Italy
Filed May 21, 1970, Ser. No. 23,089
Claims priority, application Italy Nov. 29, 1969
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13



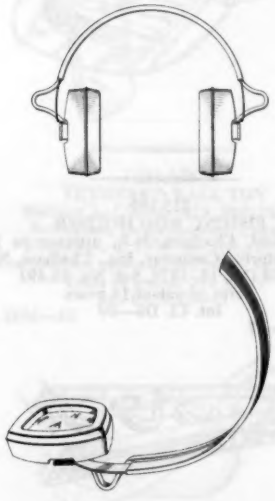
223,254
TAPE DECK
George Adams and John Hawkins, New York, N.Y., assignors to United Research Laboratory, New York, N.Y.
Filed May 18, 1970, Ser. No. 23,051
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14



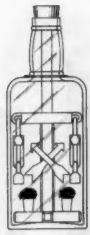
223,255
DUAL SPEAKER HOUSING
Melvin H. Boldt, Glenview, and David P. Chuboff, North Barrington, Ill., assignors to Zenith Radio Corporation, Chicago, Ill.
Filed Oct. 9, 1970, Ser. No. 25,410
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14



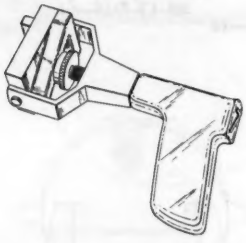
223,256
HEADSET
Ernest F. Thomson, Fairfield, Conn., assignor to KMS Industries, Inc., Ann Arbor, Mich.
Filed Nov. 16, 1970, Ser. No. 25,981
Term of patent 7 years
Int. Cl. D14—*01*
U.S. Cl. D26—14



223,257
DECORATIVE NOVELTY OR THE LIKE
Hugh N. Pace, 4629 Poole Road, Raleigh, N.C. 27610
Filed May 4, 1970, Ser. No. 22,797
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—23

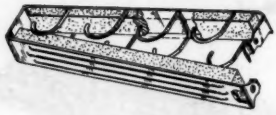


223,258
LIVESTOCK BRANDING DEVICE
Robin Ian Yeoman Gates, 22 Station Road, Redhill, England
Filed Sept. 29, 1970, Ser. No. 25,252
Claims priority, application Great Britain May 27, 1970
Term of patent 14 years
Int. Cl. D30—*08*
U.S. Cl. D30—43

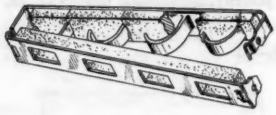


223,259
FISHING ROD HOLDER
William J. Stahl, Chatham, N.J., assignor to National Manufacturing Company, Inc., Chatham, N.J.
Filed Oct. 15, 1970, Ser. No. 25,492
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D33—17

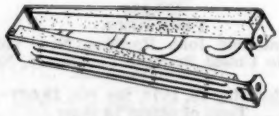
223,260
FISHING ROD HOLDER
William J. Stahl, Chatham, N.J., assignor to National Manufacturing Company, Inc., Chatham, N.J.
Filed Oct. 15, 1970, Ser. No. 25,494
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D33—17



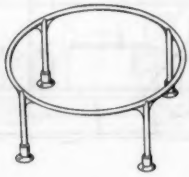
223,261
FISHING ROD HOLDER
William J. Stahl, Chatham, N.J., assignor to National Manufacturing Company, Inc., Chatham, N.J.
Filed Oct. 15, 1970, Ser. No. 25,495
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D33—17



223,262
FISHING ROD HOLDER
William J. Stahl, Chatham, N.J., assignor to National Manufacturing Company, Inc., Chatham, N.J.
Filed Oct. 15, 1970, Ser. No. 25,518
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D33—17

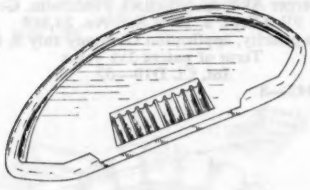


223,263
BATHING SUPPORT FOR INFANTS AND THE LIKE
Gerald Goldstein, Johannesburg, Transvaal, Republic of South Africa, assignor to Babysitter (Proprietary) Limited, Johannesburg, Transvaal, Republic of South Africa
Filed Mar. 17, 1970, Ser. No. 21,939
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D33—21

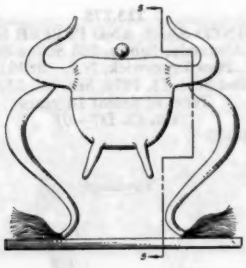


223,264
HOLDER FOR GOLF TEES AND MARKER
Peter Mondy, 137 Naomi, Arcadia, Calif. 91006
Filed Aug. 31, 1970, Ser. No. 24,781
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5

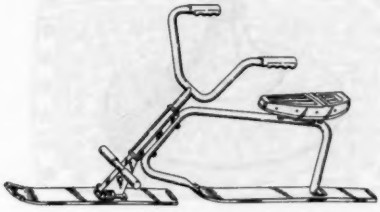
223,265
PORTABLE GAME BOARD
Milton Wolf, 3801 Johnson Ave.,
Las Vegas, Nev. 89110
Filed Feb. 12, 1971, Ser. No. 115,148
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



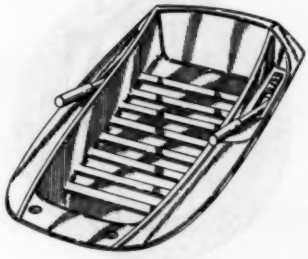
223,266
ANIMAL TOY OR SIMILAR ARTICLE
Robert V. Longfield, 49 Glenbrook Mobile Estates, 4800 Auburn Folsom Road, and Belton C. Bibb, 7077 Pine Gate Way, both of Loomis, Calif. 95650
Filed Sept. 2, 1970, Ser. No. 24,817
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15



223,267
SKI SCOOTER
Charles F. Molzen and Hangwind F. Lippisch, Wooster, Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio
Filed Sept. 23, 1970, Ser. No. 25,157
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—15

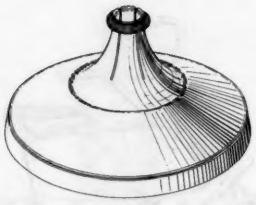


223,268
SNOW SLED
Charles F. Molzen, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Oct. 1, 1970, Ser. No. 25,294
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—15



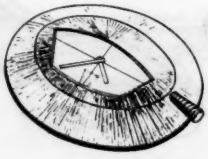
223,269
TETHERED BALL TOY
Richard L. Collver, 226 20th St. E.,
Saskatoon, Saskatchewan, Canada
Filed Nov. 2, 1970, Ser. No. 25,764
Claims priority, application Canada Oct. 28, 1970
Term of patent 3½ years
Int. Cl. D21—*01*
U.S. Cl. D34—15

223,270
SELF-ADJUSTING CHRISTMAS TREE HOLDER
Alf Georg Aarthun, 3 Gosenbakken, 4000 Stavanger, Norway
Filed Nov. 17, 1970, Ser. No. 26,042
Term of patent 14 years
Int. Cl. D11—*99*
U.S. Cl. D35—1



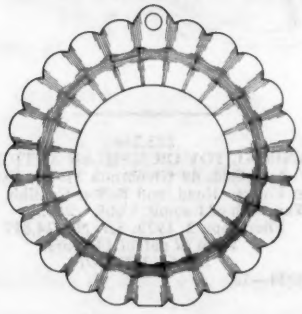
223,271
CLOCK
Edward P. Cheslock, R.D. 1, Lincoln University, Pa. 19352
Filed Sept. 3, 1970, Ser. No. 24,825
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D42—7

223,272
WRIST WATCH
Andre le Marquant, Bulle, Switzerland, assignor to Catena Watch Co. S.A., Fribourg, Switzerland
Filed Dec. 11, 1969, Ser. No. 20,466
Claims priority, application Switzerland June 26, 1969
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D42—8



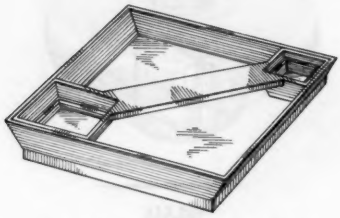
223,273
CASE FOR A PENDANT WATCH OR THE LIKE
Pirmin Ochs, Pforzheim, Germany, assignor to Rodi & Wienenberger Aktiengesellschaft, Pforzheim, Germany
Filed Sept. 8, 1970, Ser. No. 24,859
Claims priority, application Germany July 3, 1970
Term of patent 3½ years
Int. Cl. D10—*02*
U.S. Cl. D42—8

223,274
CASE FOR A PENDANT WATCH OR THE LIKE
Pirmin Ochs, Pforzheim, Germany, assignor to Rodi & Wienenberger Aktiengesellschaft, Pforzheim, Germany
Filed Sept. 8, 1970, Ser. No. 24,860
Claims priority, application Germany July 3, 1970
Term of patent 3½ years
Int. Cl. D10—*02*
U.S. Cl. D42—8

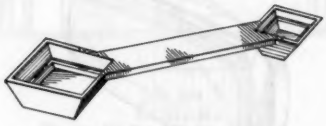


223,275
COMBINED SALT AND PEPPER SHAKER
Alexander Szopo, 346 Sudan St., New Brunswick, N.J. 08901
Filed Sept. 15, 1970, Ser. No. 25,015
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—22

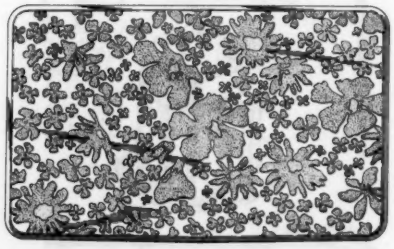
223,276
COMBINED MEASURING SPOON AND WEIGHING TRAY FOR DIET FOOD PORTIONS
William Macowski, Jr., Caldwell, N.J., assignor to Ketcham & McDougall, Inc., Roseland, N.J.
Filed Aug. 24, 1970, Ser. No. 24,673
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D44—10



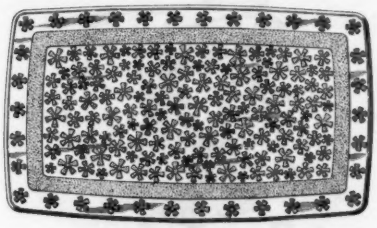
23,277
MEASURING SPOON
William Macowski, Jr., Caldwell, N.J., assignor to Ketcham & McDougall, Inc., Roseland, N.J.
Filed Aug. 24, 1970, Ser. No. 24,672
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D44—29



223,278
BATH MAT OR SIMILAR ARTICLE
Paul C. Mallonn, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Nov. 5, 1970, Ser. No. 25,842
Term of patent 14 years
Int. Cl. D7—*99;* D5—*99*
U.S. Cl. D44—31

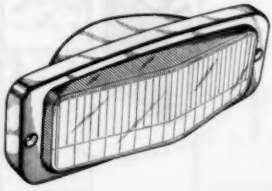


223,279
BATH MAT OR SIMILAR ARTICLE
William D. Taylor, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Nov. 5, 1970, Ser. No. 25,845
Term of patent 14 years
Int. Cl. D7—*99;* D5—*99*
U.S. Cl. D44—31



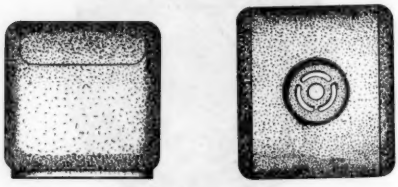
223,280
FINDING FOR A BROOCH OR THE LIKE
Leonard Page, Levittown, N.Y., assignor to Dynamic Learning Media, Inc., Farmingdale, N.Y.
Filed Apr. 13, 1970, Ser. No. 22,413
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—19

223,281
VEHICLE LAMP
Takeshige Fujita and Tetsuo Tsuruta, Tokyo, Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan
Filed Aug. 21, 1970, Ser. No. 24,642
Claims priority, application Japan June 2, 1970
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32



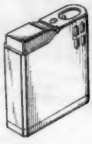
223,282
HIGH INTENSITY LAMP
Dan M. Andre, Skokie, Ill., assignor to Universal Lamp Co., Inc., Chicago, Ill.
Filed Dec. 15, 1970, Ser. No. 26,518
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20

223,283
TABLE CIGARETTE LIGHTER
Dieter Rams, Konigstein, Taunus, Germany, assignor to Braun A.G., Frankfurt am Main, Germany
Filed Nov. 18, 1970, Ser. No. 26,058
Claims priority, application Germany May 25, 1970
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D48—27

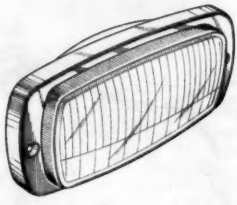


223,284
CIGARETTE LIGHTER
Sadao Yoshinaga, Tokyo, Japan, assignor to Yoshinaga Prince Co., Ltd., Tokyo, Japan
Filed Mar. 10, 1971, Ser. No. 123,118
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D48—27

223,285
CIGARETTE LIGHTER
Sadao Yoshinaga, Tokyo, Japan, assignor to Yoshinaga Prince Co., Ltd., Tokyo, Japan
Filed Mar. 10, 1971, Ser. No. 123,123
Claims priority, application Japan Sept. 22, 1970
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D47—27

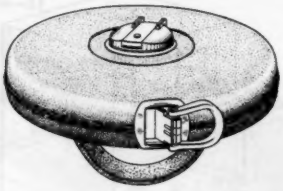


223,286
VEHICLE LAMP
Takeshige Fujita and Tetsuo Tsuruta, Tokyo, Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan
Filed Aug. 21, 1970, Ser. No. 24,643
Claims priority, application Japan June 2, 1970
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32

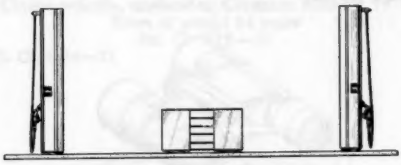


223,287
SOCKET FOR A MOP HANDLE
Raymond R. Ciprotti, P.O. Box 513, Leominster, Mass. 01453
Filed Jan. 15, 1971, Ser. No. 106,940
Term of patent 14 years
Int. Cl. D7—*05*; D4—*01*
U.S. Cl. D49—21

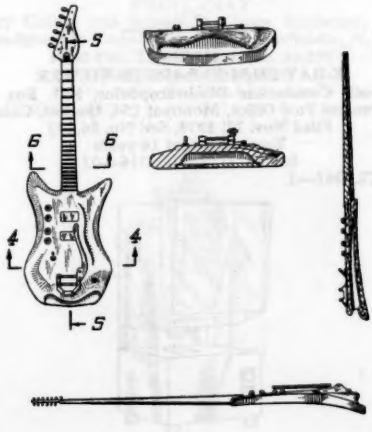
223,288
TAPE MEASURE
Andre Quenot, Besancon, France, assignor to Manufacture Quenot Mabo, Besancon, France
Filed Jan. 8, 1971, Ser. No. 105,140
Claims priority, application France Oct. 9, 1970
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—1



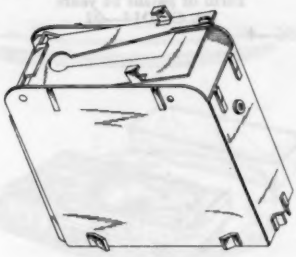
223,289
GASOLINE DISPENSER ISLAND
Hal C. Hartsell, Jr., Winston-Salem, N.C., and David D. Tompkins, Worthington, Ohio, assignors to Gilbert & Barker Manufacturing Company, New York, N.Y.
Filed July 27, 1970, Ser. No. 24,138
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—2



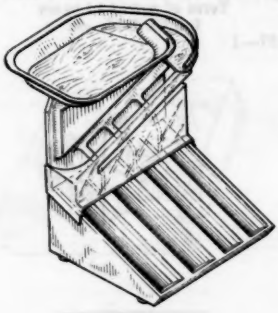
223,290
GUITAR
Hunter Wolfe, 121 Yardley Ave., Fallsington, Pa. 19054
Filed Jan. 8, 1971, Ser. No. 105,149
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1



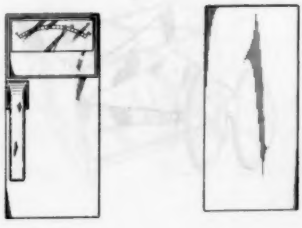
223,291
COMBINED DISPLAY AND BOX DISPENSING UNIT
Alexander N. Schoenfeld, Roslyn Heights, N.Y., assignor to Trans World Display Corporation
Filed Aug. 18, 1970, Ser. No. 24,562
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D52—2



223,292
COIN SORTER
Roger M. Brewster, 1921 Millbrook Drive, Salt Lake City, Utah 84106
Filed Oct. 21, 1970, Ser. No. 25,592
Term of patent 14 years
Int. Cl. D20—*99*
U.S. Cl. D52—4

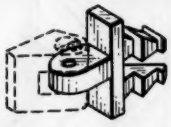


223,293
METERING INSTRUMENT
George Banks, Emerson, N.J., and Michael Iannone, Farmingdale, N.Y., assignors to The Narda Microwave Corporation, Plainview, N.Y.
Filed Mar. 23, 1970, Ser. No. 22,000
Term of patent 14 years
Int. Cl. D10—*10, 11*
U.S. Cl. D52—6

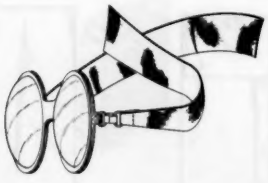


223,294
COMBINED ELECTRIC PHONOGRAPH, CASSETTE RECORDER AND REPRODUCER AND RADIO OR SIMILAR ARTICLE
Hideo Wada, Chigasaki, Sukeyoshi Nashinoki, Yokohama, and Itsuo Kato and Tsutomu Murakami, Tokyo, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Sept. 17, 1970, Ser. No. 25,047
Claims priority, application Japan Mar. 26, 1970
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4

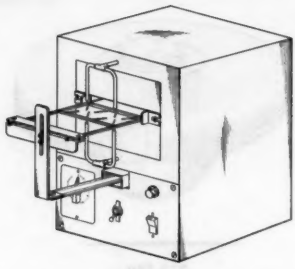
223,295
HINGE FOR SPECTACLE FRAME
Martin Obster and Anton Dietrich, Munich, Germany, assignors to Optische Werke G. Rodenstock, Munich, Germany
Filed Mar. 17, 1970, Ser. No. 21,934
Claims priority, application Germany Dec. 10, 1969
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1



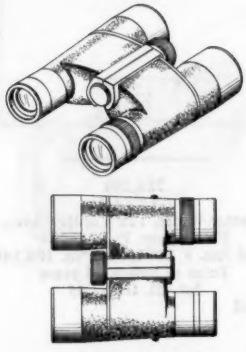
223,296
EYEGLASSES OR THE LIKE
Allen Lee, 1416 Reistertown Road, Pikesville, Md. 21208
Filed Aug. 5, 1970, Ser. No. 24,328
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1



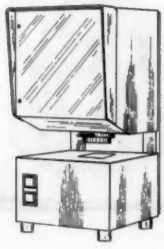
223,297
OPHTHALMIC LENS HARDENING APPARATUS
Stanley Kirk, Wantagh, N.Y., assignor to Kirk Optical Lens Co., Inc., New York, N.Y.
Filed Dec. 14, 1970, Ser. No. 26,479
Term of patent 3½ years
Int. Cl. D16—*08*
U.S. Cl. D57—1



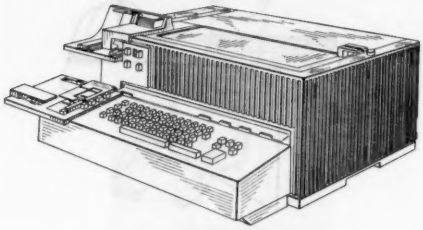
223,298
BINOCULARS
Yasuo Senda, Shin-ichi Negami, Tokyo, Japan, assignor to The Oriental Trading Company, Ltd.
Filed Dec. 22, 1970, Ser. No. 26,618
Term of patent 14 years
Int. Cl. D16—*08*
U.S. Cl. D57—1



223,299
X-RAY FILM ENLARGER-VIEWER
Panayotis Constantine Dimitracopoulos, P.O. Box 458, Outremont Post Office, Montreal 154, Quebec, Canada
Filed Nov. 27, 1970, Ser. No. 26,193
Term of patent 14 years
Int. Cl. D24—*01;* D16—*03*
U.S. Cl. D61—1



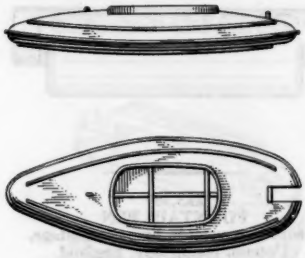
223,300
COMBINED TELEPRINTER AND PUNCHED EDGE CARD FEEDER
Ettore Sotsass, Jr., Via Mazoni 14, 20123 Milan, Italy
Continuation-in-part of design application Ser. No. 13,373, Aug. 30, 1968. This application May 8, 1970, Ser. No. 22,897
Claims priority, application Italy Mar. 1, 1968
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D64—11



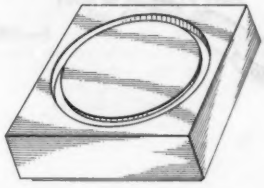
223,301
DESK TOP ELECTRONIC CALCULATOR
Manfred Link, Nuremberg, Germany, assignor to Triumph Werke Nuernberg A.G., Nuremberg, Germany
Filed Dec. 16, 1970, Ser. No. 26,534
Claims priority, application Germany June 24, 1970
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11

223,302
PAINT TRAY
Henry Golden and Samuel R. Genca, Rochester, N.Y., assignors to Tray-X Corporation, Rochester, N.Y.
Filed Dec. 21, 1970, Ser. No. 26,572
Term of patent 14 years
Int. Cl. D4—*04*
U.S. Cl. D64—18

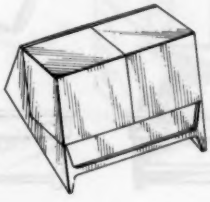
223,303
SOUTH BAY PUNT
John Magnus, 39 Washington Ave., West Sayville, N.Y. 11796, and Raymond Milek, 2026 Ambrose Place, Baldwin, N.Y. 11510
Filed Oct. 1, 1970, Ser. No. 25,289
Term of patent 7 years
Int. Cl. D12—*06*
U.S. Cl. D71—1



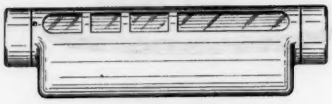
223,304
WALL CHIME
John Doggart, Macclesfield, England, assignor to V & E Friedland Limited, Macclesfield, England
Filed Sept. 9, 1968, Ser. No. 13,469
Claims priority, application Great Britain Mar. 26, 1968
Term of patent 14 years
Int. Cl. D31
U.S. Cl. D72—1



223,305
PERPETUAL CALENDAR
William S. Sherman, Highland Park, Ill., assignor to The Autopoint Company, Chicago, Ill.
Filed Aug. 18, 1969, Ser. No. 18,731
Term of patent 14 years
Int. Cl. D19—*03*
U.S. Cl. D74—5

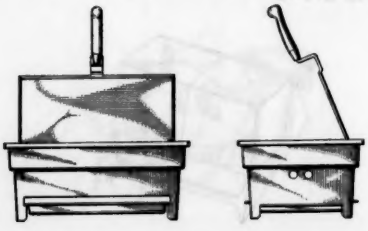


223,306
DATE CALCULATOR
Rene-Louis Revillon, Paris, France, assignor to Totaldator S.A., Courbevoie, France
Filed June 29, 1970, Ser. No. 23,715
Claims priority, application France Apr. 15, 1970
Term of patent 14 years
Int. Cl. D19—*03*
U.S. Cl. D74—5

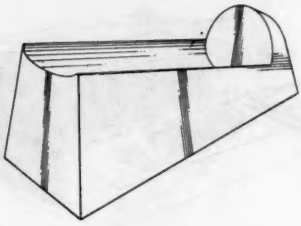


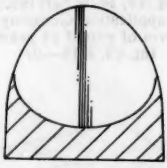
223,307
FOUNTAIN PEN
Geoffrey Nockolds, Spencer Cottage, Upham, Hampshire, England
Filed July 31, 1970, Ser. No. 24,243
Claims priority, application Great Britain Feb. 2, 1970
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D74—17

223,308
GRILL FOR COOKING FOOD
Edward M. Marshall, 8107 SW. 72nd Ave., Apt. 102E, Miami, Fla. 33143
Filed Mar. 15, 1971, Ser. No. 124,615
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D81—10

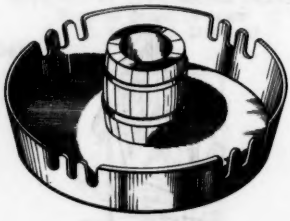


223,309
MEDICAL LUBRICANT TUBE SUPPORT STAND AND TUBE SEALING ARRANGEMENT THEREFOR
William B. van Valin, Solvang, Calif., assignor to Van Lon Ran, Ltd.
Filed Aug. 3, 1970, Ser. No. 24,271
Term of patent 14 years
Int. Cl. D24—*05*; D6—*01*
U.S. Cl. 83—1



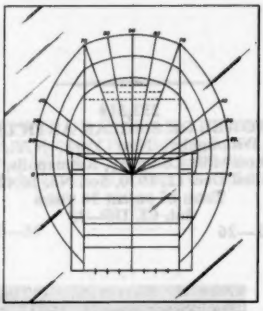


223,310
ASH TRAY
Harry W. Hollister, 89 Thayer St. 10040, and Betty Mabel Coester, 60 Seaman Ave. 10034, both of New York, N.Y.
Filed Feb. 9, 1971, Ser. No. 114,097
Term of patent 14 years
Int. Cl. D27—*03*
U.S. Cl. D85—2



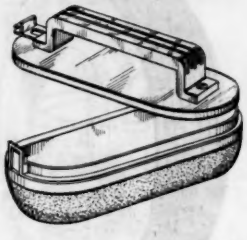
223,311
SMOKING PIPE OR SIMILAR ARTICLE
William Geiser, 903 Alto St., Monrovia, Calif. 91016
Filed May 4, 1971, Ser. No. 140,313
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D85—8

223,312
TRANSPARENT FACIAL STRUCTURE ANALYZER
Shoichi Mogi, 1332 N. Sierra Bonita, Hollywood, Calif. 90046
Filed Aug. 27, 1970, Ser. No. 24,739
Term of patent 14 years
Int. Cl. D28—*03;* D10—*11*
U.S. Cl. D86—10



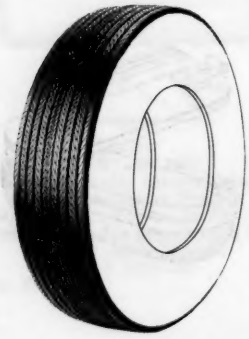
223,313
EAR RING HOLDER
Laura I. White, 321 N. Garfield, Alhambra, Calif. 91801
Filed Dec. 21, 1970, Ser. No. 26,605
Term of patent 3½ years
Int. Cl. D3—*99*
U.S. Cl. D86—10

223,314
SHOE SHINE BOX OR SIMILAR ARTICLE
Melvin A. Goldfeder, Rockville Centre, N.Y., assignor to Swank, Inc., Attleboro, Mass.
Filed Dec. 14, 1970, Ser. No. 25,477
Term of patent 14 years
Int. Cl. D28—*99*
U.S. Cl. D86—11

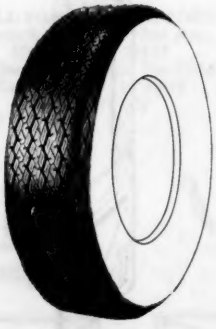


223,315
PAPER BOY COLLECTION BAG
Mary Georgina Koerber, 706 S. Garfield, Mason City, Iowa 50401
Filed June 26, 1969, Ser. No. 17,886
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—3

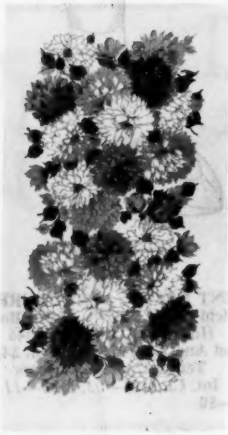
223,316
TIRE
John K. Vohs, Union City, Tenn., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Oct. 14, 1970, Ser. No. 25,485
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20



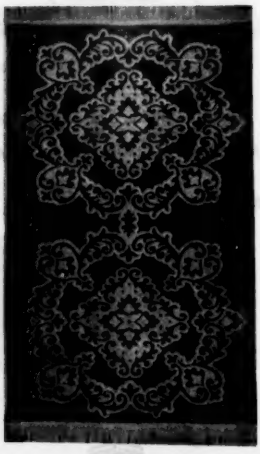
223,317
TIRE
Lance R. McKissick, Fayetteville, N.C., and Allen R. Wilson, Mogadore, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Nov. 19, 1970, Ser. No. 26,262
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20



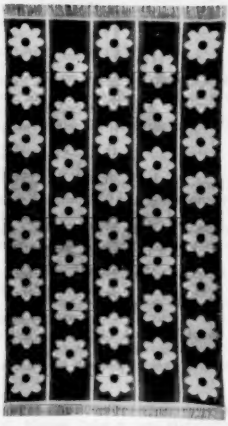
223,318
TOWEL OR SIMILAR ARTICLE
Leonard C. Clementi, Huntington, N.Y., assignor to Cannon Mills Company, Kannapolis, N.C.
Filed Oct. 26, 1970, Ser. No. 25,663
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D92—26



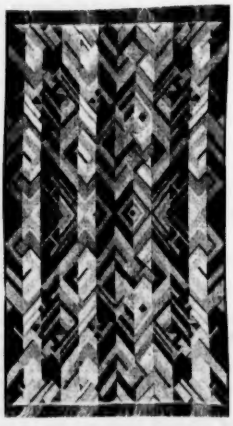
223,319
TOWEL OR SIMILAR ARTICLE
Connie C. Willoughby, New York, N.Y., assignor to Cannon Mills Company, Kannapolis, N.C.
Filed Dec. 11, 1970, Ser. No. 26,421
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D92—26



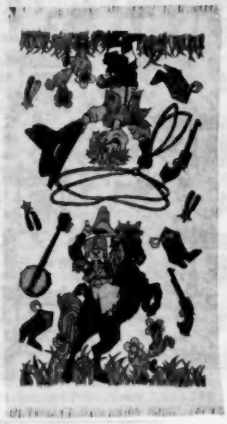
223,320
TOWEL OR SIMILAR ARTICLE
Edward C. Taiman, New Fairfield, Conn., assignor to Cannon Mills Company, Kannapolis, N.C.
Filed Feb. 16, 1971, Ser. No. 115,909
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D92—26



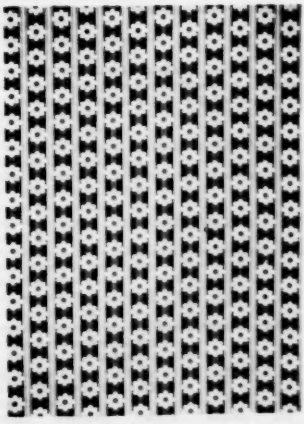
223,321
TOWEL OR SIMILAR ARTICLE
Nancy Ann Scherer, Plainfield, N.J., assignor to Cannon Mills Company, Kannapolis, N.C.
Filed Feb. 16, 1971, Ser. No. 115,910
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D92—26



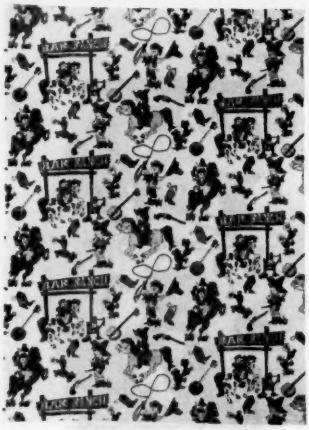
223,322
TOWEL OR SIMILAR ARTICLE
Nancy Ann Scherer, Plainfield, N.J., assignor to Cannon Mills Company, Kannapolis, N.C.
Filed Feb. 16, 1971, Ser. No. 115,925
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D92—26



223,323
SHEET OR SIMILAR ARTICLE OF BED LINEN
Edward C. Taiman, New Fairfield, Conn., assignor to Cannon Mills Company, Kannapolis, N.C.
Filed Feb. 16, 1971, Ser. No. 115,936
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D92—26



223,324
SHEET OR SIMILAR ARTICLE OF BED LINEN
Nancy Ann Scherer, Plainfield, N.J., assignor to Cannon Mills Company, Kannapolis, N.C.
Filed Feb. 16, 1971, Ser. No. 115,922
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D92—26



223,325
BEVERAGE DISPENSER
Dana W. Mox, Glenview, Ill., assignor to Karma Division of Brandt Automatic Cashier Company, Addison, Ill.
Filed Oct. 29, 1970, Ser. No. 25,707
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D94—3

LIST OF PATENTEES

TO WHOM

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AB Volvo Penta: *See—*
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Abbott Laboratories: *See—*
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Abel, Allen J. Support device for fluid receptacles. 3,653,624, Cl. 248-312.

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Ableson, Arthur E., to American Potash & Chemical Corporation. Inhibition of sodium bicarbonate crystallization during crystallization of other materials using polyphosphates. 3,653,847, Cl. 23-302.

Aboul-Saad, Ibrahim Ahmed, to Du Pont de Nemours, E. I., and Company. Pad-acid steam nylon-cotton blend with acid and vat dyes. 3,653,801, Cl. 8-21.

Abram, Guy R.; and Offerman, Emil, to Mathew Moody Ltd. Tow truck. 3,653,328, Cl. 104-172.

Abrams, Paul S.; and Peterson, Rudolph G., to Carcs, Inc. Marking device. 3,653,596, Cl. 239-93.

Abrams, Richard Lee; and Glass, Alastair Malcolm, to Bell Telephone Laboratories, Incorporated. Narrow band electromagnetic, pyroelectric radiation devices using piezoelectric detectors. 3,654,466, Cl. 250-83.3

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Adams, William H.; and Painter, Charles D., to Armstrong Cork Company. Seam sealer dispensing head. 3,653,560, Cl. 222-566.

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AGA Aktiebolag: *See—*
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Bluethman, Robert G.; Goldsberry, Paul E.; McConnell, Robert L.; and Simpson, Jack W., to International Business Machines Corporation. Proportional spacing visual editing system. 3,654,609, Cl. 340-172.5

Bluethman, Robert G.; and Simpson, Jack W., to International Business Machines Corporation. Visual editing system incorporated controls for justifying and dejustifying displayed text. 3,654,611, Cl. 340-172.5

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Blumel, Harald, to Chemische Werke Huls Aktiengesellschaft. Vulcanization of unsaturated ethylene-α olefin rubbers. 3,654,243, Cl. 260-79.5

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Bochinski, Julius H., to North American Rockwell Corporation. Programmed fluid sampling and analysis apparatus. 3,654,113, Cl. 204-195.

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Bock, Robert V.; Rehhausser, Frederick; Earnest, Elmer Dean; Gerbstadt, Frederick H.; and White, James A., to Burroughs Corporation. Information processing system having means for dynamic memory address preparation. 3,654,621, Cl. 340-172.5

Boebel, Carl P.; and Stevenson, Gary E., to United States of America, Air Force. Method of controlling temperature distribution of a spacecraft. 3,653,942, Cl. 117-33.3

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Boetto, Charles; Stufflebeam, John F.; and Artman, Noel G., to International Harvester Company. Rotary cultivator wheel. 3,653,449, Cl. 172-548.

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Bogue, David L.; and Fisher, William E., to KMS Industries, Inc. Method of bonding skin to concrete. 3,654,018, Cl. 156-245.

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Bolhofer, William A., to Merck & Co., Inc. 2-Chlorobenzothiazolecarboxamides. 3,654,296, Cl. 260-304.

Bolles, Theodore F., to Minnesota Mining and Manufacturing Company. Disposable reserve cell with encapsulated electrolyte. 3,653,972, Cl. 136-90.

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Bonner, William Adam, to Bell Telephone Laboratories, Incorporated. Technique for the growth of single crystal lead molybdate. 3,653,814, Cl. 23-15.

Bonneson, Gail G. Means for collecting coins from a coin operated machine. 3,653,586, Cl. 232-43.2

Bonsignore, Patrick V., to Rohm and Haas Company. High impact resistant thermoplastic substrate coated with non-embrittling paint system. 3,653,950, Cl. 117-72.

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Bourette, Jean. Granulated cork and calcined fossil silica filler hot top material. 3,654,199, Cl. 260-17.2

Bourgraf, Elroy E.; and Self, Kenneth R., to Ferno-Washington Inc. Adjustable break-away splint-stretcher. 3,653,079, Cl. 5-82.

Boxall, Ronald Stanley George; and Dennes, Anthony Charles, to Mars Incorporated. Electrical/electronic coin or token indentification system. 3,653,481, Cl. 194-100.

Boyce, Kenneth D., to Diversified Electronics Co., Inc. Calculator input means to bypass conventional keyboard input. 3,654,449, Cl. 235-156.

Boyer, William M.; and Hattori, Kiyoshi. Novel fiber glass-reinforced resin compositions and processes for their preparation. 3,654,219, Cl. 260-41.5

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Braid, Milton, to Mobil Oil Corporation. Esters of phosphorodithioates. 3,654,154, Cl. 252-46.6

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Bratzler, Karl; Doerges, Alexander; Hochgesand, Gerhard; and Grunewald, Gerhard, to Metallgesellschaft Aktiengesellschaft. Process for a fine purification of hydrogen- containing gases. 3,653,810, Cl. 23-2.

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Brokke, Mervin E.; Williamson, Thomas B.; and Lukes, George E., deceased0 (by Jaeschke, Wayne C.; special administrator), to Stauffer Chemical Company. 3,4,4-Trifluoro-3-butenylthio methylidene compounds and their utility. 3,654,333, Cl. 260-453.

Brokke, Mervin E.; Williamson, Thomas B.; and Lukes, George E., deceased0 (by Jaeschke, Wayne C.; special administrator), to Stauffer Chemical Company. 3,4,4-Trifluoro-3-butenyl) N-substituted isothiourea compounds and their utility. 3,654,362, Cl. 260-564.

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Brunnock, John Vincent, deceased (by Brunnock, Pamela Mary, legal representative); and Luke, Leonard Arthur, to British Petroleum Company Limited, The. Discovery in separation of hydrocarbons. 3,654,145, Cl. 208-310.

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Yamamoto, Akira; and Moriyama, Keiichi, to Teijin Limited. Method of washing polyamide producing apparatus. 3,653,964, Cl. 134-42.

Yamamoto, Mititaka; and Nagata, Masanori, to Omron Tateisi Electronics Co. Automatic vending system. 3,653,480, Cl. 194-4.

Yamamoto, Takamitu: *See—*
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Yamamoto, Yosizi: *See—*
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Yamamoto, Yukio, to Nissan Motor Company, Limited, and Kanto Seiki Company, Limited. Steering locking device. 3,654,600, Cl. 340-52.

Yamamuro, Hiroshi, to Tokyo Shibaura Co., Ltd. Apparatus for measuring the dimensions of objects. 3,653,770, Cl. 356-160.

Yamanaka, Einemi, to Cabin Kogyo Kabushiki Kaisha. Overhead projector. 3,653,754, Cl. 356-61.

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Yeakey, Ernest L., to Jefferson Chemical Company, Inc. Process for preparing polyoxyalkylene polyamines. 3,654,370, Cl. 260-584.

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Yoshida, Mitsuo; Kai, Hisao; and Yamane, Tetsuo, to Asahi Kasei Kogyo Kabushiki Kaisha. Electrolysis of salt solution. 3,654,104, Cl. 204-98.

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Zagorskaya, Maina Konstantinovna; Vulikh, Alexandr Ilich; Mekler, Lev Izrailevich; and Ksenzenko, Vladimir. Method of removing hydrogen halides from sulphur dioxide gas. 3,653,811, Cl. 23-2.

Zaitseva, Aita Konstantinovna: *See—*
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Zbikowski, Theodore H.; Jensen, Douglas S.; and Pfeilsticker, Lee J., to Tonka Corporation. Toy tow truck. 3,653,147, Cl. 46-40.

Zeeb, Rhinhold J. (Lathe attachment) apparatus for adjusting the center of a turning machine. 3,653,287, Cl. 82-33.

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Dias, Fleming, 3,654,574.
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Ziehr, Georg; and Heidenbluth, Heinz-Dieter, to Henkel & Cie G.m.b.H. Compositions for displacing water adhering to metal surfaces and process. 3,653,983, Cl. 148-6.14

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Batchelder, George W.; and Zimmerman, Gilbert A.,3,653,994.

Zinkin, Harold, to Whittaker Corporation. Wrist exerciser device. 3,653,659, Cl. 272-68.

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Zurmuehlen, Robert C., to American Air Filter Company, Inc. Storage tank. 3,653,531, Cl. 220-5.

LIST OF PLANT PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 4TH DAY OF APRIL, 1972

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Ball, Geo. J., Inc. : *See*—
Roberts, Alfred N. 3,093.
Sweet, Jack S. 3,094.

Conard-Pyle Co., The : *See*—
Meilland, Marie-Louise. 3,095.
Meyer, Carl. 3,097.

Ecke, Paul, Inc. : *See*—
Hegg, Thormod. 3,099.

Flemer, William, III, to Treesearch. Shadblow tree. 3,092, 4–4–72, Cl. 51.

Halka, Chester J., to Frank J. Schmidt & Son Co. Honeylocust tree. 3,096, 4–4–72, Cl. 52.

Hegg, Thormod, to Paul Ecke, Inc. Poinsettia plant. 3,099, 4–4–72, Cl. 86.

Meilland, Marie-Louis, to The Conard-Pyle Co. Rose plant. 3,095, 4–4–72, Cl. 18.

Meyer, Carl, to The Conard-Pyle Co. Rose plant. 3,097, 4–4–72, Cl. 11.

Pipkin, William T. Plum tree. 3,100, 4–4–72, Cl. 38.

Roberts, Alfred N., to Geo. J. Ball, Inc. White Azalea plant. 3,093, 4–4–72, Cl. 55.

Schmidt, Frank J., & Son Co. : *See*—
Halka, Chester J. 3,096.

Sweet, Jack S., to Geo. J. Ball, Inc. Rose plant. 3,094, 4–4–72, Cl. 26.

Swim, Herbert C., and O. L. Weeks, to O. L. Weeks, d.b.a. Weeks Wholesale Rose Grower. Rose plant. 3,098, 4–4–72, Cl. 20.

Treesearch : *See*—
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Weeks, O. L. : *See*—
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Weeks Wholesale Rose Grower : *See*—
Swim, Herbert C., and Weeks. 3,098.

Zaiger, Chris F. Nectarine tree. 3,101, 4–4–72, Cl. 41.

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Adams, George, and J. Hawkins, to United Research Laboratory. Tape deck. 223,254, 4–4–72, Cl. D26—14.

Anderson Bros. Mfg. Co. : *See*—
Jacobson, William P. 223,232.

Andre, Dan M., to Universal Lamp Co., Inc. High intensity lamp. 223,282, 4–4–72, Cl. D48—20.

Archibald, Emanuel R. Electrician's combined wire holder and heat absorber, or similar article. 223,227, 4–4–72, Cl. D8—71.

Autopoint Co., The : *See*—
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Babysitter Proprietary Ltd. : *See*—
Goldstein, Gerald. 223,263.

Banks, George, and M. Iannone, to The Narda Microwave Corp. Metering instrument. 223,293, 4–4–72, Cl. D52—6.

Bibb, Belton C. : *See*—
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Boldt, Melvin H., and D. P. Chuboff, to Zenith Radio Corp. Dual speaker housing. 223,255, 4–4–72, Cl. D26—14.

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Braun A.G. : *See*—
Rams, Dieter. 223,283.

Brewster, Roger M. Coin sorter. 223,292, 4–4–72, Cl. D52—4.

Brodsky, David L. and E. J., to Superior Plastic Products Co. Suction catheter. 223,247, 4–4–72, Cl. D16—1.

Brodsky, Elliott J. : *See*—
Brodsky, David L. and E. J. 223,247.

Busby, Howard A., and P. D. Dail. Ceiling runner. 223,235, 4–4–72, Cl. D13—1.

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Clementi, Leonard C., to Cannon Mills Co. Towel or similar article. 223,318, 4–4–72, Cl. D92—26.

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Commans, Bryan F., and I. Irvin, to The House of Commans, Inc. Jewelry display box. 223,233, 4–4–72, Cl. D9—239.

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Essoldo Furnishers Ltd. : *See*—
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Fujita, Takeshige, and T. Tsuruta, to Stanley Electric Co., Ltd. Vehicle lamp. 223,286, 4–4–72, Cl. D48—32.

Gates, Robin Ian Yeoman. Livestock branding device. 223,258, 4–4–72, Cl. D30—43.

Geiser, William. Smoking pipe or similar article. 223,311, 4–4–72, Cl. D85—8.

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Goldfeder, Melvin A., to Swank, Inc. Shoe shine box or similar article. 223,314, 4–4–72, Cl. D86—11.

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Macowski, William, Jr., to Ketcham & McDougall, Inc. Measuring spoon. 223,277, 4-4-72, Cl. 44—29.

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Magram, Ronald L. Bedstead for children. 223,225, 4-4-72, Cl. D5—4.

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Ochs, Pirmin, to Rodi & Wienenberger Aktiengesellschaft. Case for a pendant watch or the like. 223,274, 4-4-72, Cl. D42—8.

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Senda, Yasuo, and S. Negami, to The Oriental Trading Co., Ltd. Binoculars. 223,298, 4-4-72, Cl. D57—1.

Sherman, William S., to The Autopoint Co. Perpetual calendar. 223,305, 4-4-72, Cl. D74—5.

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Stahl, William J., to National Mfg. Co., Inc. Fishing rod holder. 223,259, 4-4-72, Cl. D33—17.

Stahl, William J., to National Mfg. Co., Inc. Fishing rod holder. 223,260, 4-4-72, Cl. D33—17.

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Schoenfeld, Alexander N. 223,291.

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Golden, Henry, and Genca. 223,302.

Triumph Werke Nurenberg A.G.: *See*—
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Fujita, Takeshige, and Tsuruta. 223,281.
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Adams, George, and Hawkins. 223,254.

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Andre, Dan M. 223,282.

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CLASSIFICATION OF PATENTS

ISSUED APRIL 4, 1972

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

80 3,653,074
338 3,653,075

CLASS 4

236 3,653,076
3,653,077
263 3,653,078

CLASS 5

82 3,653,079
108 3,653,080
262 3,653,081
269 3,653,082
348 3,653,083

CLASS 8

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15 3,653,798
18 3,653,799
21B 3,653,801
21C 3,653,800
31 3,653,803
110 3,653,804
116.4 3,653,805
130.1 3,653,806
158 3,653,807
3,653,808

CLASS 9

2A 3,653,084
8 3,653,085
329 3,653,086

CLASS 12

20 3,653,087
50.5 3,653,088
142R 3,653,089

CLASS 13

9 3,654,373
31 3,654,374

CLASS 15

105 3,653,090

CLASS 16

94 3,653,091
128 3,653,092

CLASS 17

11 3,653,093

CLASS 19

83 3,653,094

CLASS 21

2.7 3,653,095

CLASS 23

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2R 3,653,810
2 3,653,811
15W 3,653,813
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21 3,653,817
59 3,653,818
63 3,653,819
79 3,653,820
106 3,653,821
121 3,653,822
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149 3,653,825
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203R 3,653,834
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230R 3,653,835
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3,653,841
253A 3,653,842
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288M 3,653,844
288R 3,653,845
289 3,653,846
296 3,653,847
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33C 3,653,097
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CLASS 28

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53 3,653,182
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310 3,653,191

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152A 3,653,203

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713 3,653,280
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162 3,653,303

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1.3 3,653,892
1.4 3,653,893
1.7 3,653,894
3 3,653,896
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35 3,653,898
36.1 3,653,900
3,653,901
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49 3,653,902
3,653,903
50 3,653,904
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71 3,653,910
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116 3,653,919
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104R 3,653,951
126GB 3,653,961
126GN 3,653,952
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132C 3,653,954
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66 3,653,376
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266 3,653,380
284 3,653,381
3,653,382
296 3,653,383
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303.17 3,653,385
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354 3,653,389
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CLASS 131

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CLASS 132

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355.17 3,653,401
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12.1 3,653,990
12.4 3,653,981
31 3,653,982
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113 3,653,984
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3,653,995
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18 3,654,001
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43 3,654,053
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60 3,654,055
62 3,654,056
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69 3,653,452

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4 3,653,480
9 3,653,479
100A 3,653,481

CLASS 195

28R 3,654,078
3,654,079
31R 3,654,080
3,654,081
3,654,082
63 3,654,083
3,654,086
65 3,654,087
3,654,088
3,654,089
95 3,654,084
103.5R 3,654,090
127 3,654,085
139 3,654,091

CLASS 197

128 3,653,482
129 3,653,483

CLASS 198

16R 3,653,484
25 3,653,485
36 3,653,486
3,653,487
38 3,653,488
110 3,653,489
153 3,653,490
171 3,653,491
175 3,653,492
189 3,653,493
195 3,653,494

CLASS 200

33R 3,654,408
48R 3,654,409
61.19 3,654,411
61.45R 3,654,410
83Z 3,654,412
86R 3,654,407
156 3,654,413
167R 3,654,414
168G 3,654,415
3,654,416

CLASS 202

174 3,654,092

CLASS 203

8 3,654,093
77 3,654,094

CLASS 204

2 3,654,095
12 3,654,096
15 3,654,097
20 3,654,098
29 3,654,099
35N 3,654,100
51 3,654,101
83 3,654,102
92 3,654,103
98 3,654,104
101 3,654,105
159.23 3,654,106
163R 3,654,107
164 3,654,108
192 3,654,110
195R 3,654,111
195 3,654,112
3,654,114
206 3,654,114
216 3,654,115
224 3,654,116
3,654,117
225 3,654,118
228 3,654,119
255 3,654,120
290F 3,654,121
297R 3,654,122
298 3,654,109
3,654,123
299 3,654,124
301 3,654,125
314 3,654,126

CLASS 206

45.12 3,653,495
46FN 3,653,496
46H 3,653,498
46M 3,653,497
47A 3,653,499
56AA 3,653,500
62R 3,653,501
63.2R 3,653,502
65C 3,653,503
65E 3,653,504

CLASS 208

14 3,654,127
33 3,654,128
48 3,654,129
54 3,654,134
57 3,654,130
3,654,131
3,654,132
59 3,654,133
71 3,654,135
3,654,136
87 3,654,137
89 3,654,139
111 3,654,138
113 3,654,140
120 3,654,141
140 3,654,142
146 3,654,143
245 3,654,144
310 3,654,145

CLASS 209

44 3,653,505
74 3,653,506
97 3,653,507
3,653,508
102 3,653,509

CLASS 210

6 3,654,146
3,654,147
23 3,654,148
61 3,654,149
69 3,654,150
83 3,653,510
112 3,653,511
130 3,653,512
169 3,653,513
281 3,653,514

CLASS 211

13 3,653,515
43 3,653,516

CLASS 212

1 3,653,517
125 3,653,518

CLASS 214

1R 3,653,519
17DB 3,653,520
38CA 3,653,521
83.3 3,653,522
138 3,653,523
145 3,653,524
309 3,653,525
313 3,653,526
331 3,653,527

CLASS 215

38R 3,653,528
41 3,653,529
43 3,653,530

CLASS 219

10.55 3,654,417
56 3,654,418
60R 3,654,419
69S 3,654,420
70 3,654,421
81 3,654,422
95 3,654,423
110 3,654,424
125PL 3,654,425
209 3,654,426
241 3,654,427
288 3,654,428
346 3,654,429
347 3,654,430
373 3,654,431
374 3,654,432

CLASS 220

5A 3,653,531
9F 3,653,532
40R 3,653,533
46R 3,653,534
54 3,653,535
3,653,536
85 3,653,537

CLASS 221

1 3,653,538
73 3,653,539
75 3,653,540
150HC 3,653,541
307 3,653,542

CLASS 222

52 3,653,543
55 3,653,544
61 3,653,545
83 3,653,546
94 3,653,547
129.1 3,653,548
132 3,653,549
136 3,653,550
3,653,551
146HE 3,653,552
148 3,653,553
181 3,653,554
256 3,653,555
309 3,653,556
400.7 3,653,557
402.17 3,653,558
545 3,653,559
566 3,653,560

CLASS 223

66 3,653,563
70 3,653,561
76 3,653,562

CLASS 224

1A 3,653,564
5R 3,653,565
25A 3,653,566
42.42R 3,653,567

CLASS 226

97 3,653,568
140 3,653,569

CLASS 227

81 3,653,570

CLASS 228

3 3,653,571
8 3,653,573
20 3,653,572
49 3,653,574

CLASS 229

1.5H 3,653,575
22 3,653,576
23R 3,653,577
23 3,653,578
37R 3,653,579
40 3,653,580
43 3,653,581
51TC 3,653,582
54C 3,653,583
62 3,653,584
85 3,653,585

CLASS 232

43.2 3,653,586

CLASS 235

7A 3,654,433
50R 3,653,587
61.11E 3,654,434
61.12M 3,654,435
78 3,654,436
84 3,654,437
3,654,438
92LG 3,654,441
92PC 3,654,439
3,654,442
92PE 3,654,440
150.2 3,654,443
151.1 3,654,444
151.12 3,654,447
151.3 3,654,445
3,654,446
153 3,654,448
156 3,654,449
197 3,654,450

CLASS 236

49 3,653,588
3,653,589
3,653,590

CLASS 238

308 3,653,591

CLASS 239

15 3,653,592
3,653,593
70 3,653,594
3,653,595
93 3,653,596
204 3,653,597
229 3,653,598
273 3,653,599

CLASS 240

3 3,654,451
8.16 3,654,452
25 3,654,453
41.35E 3,654,454
93 3,654,455

CLASS 241

74 3,653,600

CLASS 242

55.19A 3,653,601
60 3,653,602
68.3 3,653,603
71.2 3,653,604
74 3,653,605

86.8 3,653,606
191 3,653,607
199 3,653,608

CLASS 244

13 3,653,609
48 3,653,611
83E 3,653,612
103R 3,653,613
137R 3,653,614
137 3,653,615
150 3,653,616

CLASS 246

182B 3,654,456

CLASS 248

42 3,653,617
58 3,653,618
99 3,653,619
101 3,653,620
119S 3,653,621
221 3,653,622
231 3,653,623
312 3,653,624
358R 3,653,625
371 3,653,626
488 3,653,627

CLASS 249

19 3,653,629
214 3,653,628

CLASS 250

41.9S 3,654,457
43.5FL 3,654,458
49.5TE 3,654,459
51.5 3,654,460
65ZE 3,654,461
65 3,654,462
71R 3,654,463
71.5R 3,654,464
71.5S 3,654,465
83.1 3,654,467
83.3H 3,654,466
83.3R 3,654,468
83.6R 3,654,469
83.6W 3,654,470
85 3,654,471
106 3,654,472
199 3,654,473
203 3,654,475
206 3,654,474
211J 3,654,476
217SS 3,654,477
219DC 3,654,478
231SE 3,654,479
231R 3,654,480

CLASS 251

129 3,653,630
159 3,653,631
304 3,653,632
354 3,653,633

CLASS 252

8.5A 3,654,164
8.5C 3,654,151
30 3,654,171
32.7 3,654,152
42.1 3,654,153
46.6 3,654,154
46.7 3,654,155
49.5 3,654,156
49.9 3,654,157
3,654,158
62.56 3,654,161
62.57 3,654,162
62.63 3,654,163
62.9 3,654,159
3,654,160
90 3,654,165
117 3,654,166
119 3,654,167
135 3,654,168
180 3,654,169
181 3,654,170
301.4F 3,654,172
301.4P 3,654,173
3,654,174
305 3,654,175
313R 3,654,176
356 3,654,177
3,654,178
408 3,654,179
3,654,180
414 3,654,181
415 3,654,182
431N 3,654,183
442 3,654,184
455Z 3,654,185
465 3,654,186
511 3,654,187
520 3,654,188

CLASS 254

29A 3,653,634
172 3,653,635
173 3,653,636

CLASS 259

4 3,653,638
3,653,639
3,653,640
7 3,653,637

CLASS 260

2N 3,654,191
2P 3,654,189
2R 3,654,192
2.5AH 3,654,195
2.5AP 3,654,194
2.5M 3,654,193
2.5N 3,654,196
4R 3,654,197
16 3,654,198
17.2 3,654,199
3,654,200
19UA 3,654,203
23ST 3,654,201
23H 3,654,202
27 3,654,206
28.5AV 3,654,207
29.6ME 3,654,208
29.6TA 3,654,209
29.6F 3,654,210
31.6 3,654,211
32.6A 3,654,212
33.6AQ 3,654,214
33.6UA 3,654,213
37SB 3,654,215
37N 3,654,227
41B 3,654,216
41 3,654,217
41.5A 3,654,219
41.5R 3,654,218
45.75K 3,654,222
45.9R 3,654,220
3,654,221
45.95 3,654,223
47C 3,654,225
50 3,654,226
67FP 3,654,228
67.6R 3,654,229
75NR 3,654,230
75M 3,654,231
75R 3,654,233
3,654,234
75T 3,654,232
78A 3,654,238
78R 3,654,236
3,654,237
78S 3,654,235
78.4N 3,654,239
78.5 3,654,240
79 3,654,241
79.3R 3,654,242
79.5B 3,654,243
79.7 3,654,244
80 3,654,245
80.7 3,654,246
86.1E 3,654,247
87.5 3,654,248
88.2C 3,654,250
88.2 3,654,249
88.3 3,654,251
92.8A 3,654,252
94.9B 3,654,254
94.9R 3,654,253
97.6 3,654,255
105 3,654,256
141 3,654,257
154 3,654,258
157 3,654,259
205 3,654,260
210R 3,654,261
3,654,262
215FP 3,654,190
233.3R 3,654,263
239A 3,654,264
239.1 3,654,265
3,654,266
239.3A 3,654,268
239.3D 3,654,267
240A 3,654,269
243AA 3,654,270
247 3,654,271
247.2R 3,654,272
248CS 3,654,273
249.8 3,654,274
250R 3,654,275
251A 3,654,204
3,654,205
268PH 3,654,278
268H 3,654,276
268R 3,654,277
270R 3,654,279
285 3,654,280
286R 3,654,281
3,654,282
289R 3,654,283
3,654,284
290P 3,654,285
293.57 3,654,286
293.62 3,654,287
293.76 3,654,288
294.8G 3,654,293
295C 3,654,289
296R 3,654,290
297R 3,654,291
302A 3,654,294
302R 3,654,295
304 3,654,296
306.5 3,654,297
307C 3,654,298
309 3,654,299
309.6 3,654,300
325 3,654,301
326S 3,654,302
326.12R 3,654,303
326.13R 3,654,308
326.3 3,654,304
326.5FM 3,654,306
326.5A 3,654,307
326.5R 3,654,305
332.2C 3,654,310
332.3R 3,654,309
340.9 3,654,311
343.2R 3,654,312
343.3 3,654,313
3,654,314
3,654,315
345.7 3,654,316
348.5L 3,654,317
348.5R 3,654,318
376 3,654,319
397.4 3,654,320
3,654,321
398 3,654,322
400 3,654,323
410.9R 3,654,324
412.4 3,654,325
413 3,654,326
418 3,654,327
429.9 3,654,328
3,654,329
440 3,654,330
448R 3,654,331
448.2N 3,654,332
453PH 3,654,336
453R 3,654,333
454 3,654,334
456R 3,654,335
463 3,654,337
3,654,338
464 3,654,339
465.4 3,654,340
465.5R 3,654,341
465.8 3,654,342
473R 3,654,343
475P 3,654,224
481R 3,654,344
482R 3,654,346
484R 3,654,347
486R 3,654,345
508 3,654,348
515M 3,654,349
524R 3,654,356
525 3,654,350
3,654,351
3,654,352
527R 3,654,353
533C 3,654,355
533N 3,654,354
544Y 3,654,358
551S 3,654,359
552R 3,654,357
558R 3,654,360
561A 3,654,361
564E 3,654,362
571 3,654,364
575 3,654,365
577 3,654,363
580 3,654,366
3,654,367
583EE 3,654,368
583NH 3,654,369
584B 3,654,370
586A 3,654,371
606.5P 3,654,372

CLASS 261

18 3,653,641
39B 3,653,642
56 3,653,643

CLASS 263

21A 3,653,644
32R 3,653,645

CLASS 266

23T 3,653,646
31 3,653,647
35 3,653,650
36P 3,653,648
3,653,649

CLASS 267

64B 3,653,651
71 3,653,652
165 3,653,653

CLASS 271

44 3,653,654
62B 3,653,655
68 3,653,656

CLASS 272

29 3,653,657
63 3,653,658
68 3,653,659

CLASS 273

29A 3,653,660
85D 3,653,661
95R 3,653,662
96R 3,653,663
106.5B 3,653,664
125R 3,653,665
126R 3,653,666
134D 3,653,667
135AE 3,653,668

CLASS 274

4F 3,653,669

CLASS 277

103 3,653,671
164 3,653,670
205 3,653,672
227 3,653,673
231 3,653,674
235 3,653,675

CLASS 280

6R 3,653,676
8 3,653,677
11.23 3,653,678
32.7 3,653,679
34A 3,653,680
36B 3,653,681
124F 3,653,682
3,653,683
150AB 3,653,684
150R 3,653,685
421 3,653,686
476R 3,653,687

CLASS 285

105 3,653,688
113 3,653,689
226 3,653,690
236 3,653,691
242 3,653,692
317 3,653,693
334.4 3,653,694
340 3,653,695
403 3,653,696

CLASS 287

56 3,653,697
189.36C 3,653,698

CLASS 290

37 3,653,699

CLASS 292

49 3,653,700
87 3,653,701
106 3,653,703
218 3,653,704
251 3,653,702
256.65 3,653,705

CLASS 294

31.2 3,653,610
65.5 3,653,706
67D 3,653,707
102R 3,653,708

CLASS 296

1S 3,653,709
39R 3,653,710
107 3,653,711

CLASS 297

218 3,653,712
232 3,653,713
385 3,653,714
439 3,653,715

CLASS 299

1 3,653,716
5 3,653,717

CLASS 301

37S 3,653,719
38R 3,653,718

CLASS 302

15 3,653,720

CLASS 303

6C 3,653,721
3,653,722
19 3,653,724
20 3,653,723
21CG 3,653,726
21F 3,653,725
21P 3,653,727
22R 3,653,728
50 3,653,729
89 3,653,730

CLASS 307

10R 3,654,481
88.3 3,654,482
109 3,654,483
149 3,654,484
210 3,654,485
214 3,654,486
227 3,654,487
237 3,654,488
252W 3,654,489
255 3,654,490
262 3,654,491
269 3,654,492
289 3,654,493
293 3,654,494
3,654,495
303 3,654,498
304 3,654,496
3,654,499
312 3,654,497

CLASS 308

184 3,653,731
193 3,653,732

CLASS 310

8.3 3,654,500
10 3,654,501
26 3,654,502
162 3,654,503
239 3,654,504

CLASS 312

39 3,653,733
107 3,653,734
330 3,653,735

CLASS 313

92B 3,654,505
184 3,654,506
198 3,654,507
3,654,508

CLASS 315

3.5 3,654,509
29 3,654,510
59 3,654,511
64 3,654,512
111 3,654,513
156 3,654,514

CLASS 317

18D 3,654,515
27R 3,654,516
33R 3,654,517
3,654,518
36TD 3,654,519
61 3,654,520
100 3,654,521
134 3,654,522
230 3,654,523
3,654,524
3,654,525
234R 3,654,526
3,654,527
3,654,528
3,654,529
235P 3,654,531
235R 3,654,530
258 3,654,532
3,654,533
262AE 3,654,534

CLASS 318

118 3,654,540
267 3,654,535
466 3,654,536

CLASS 320

1 3,654,537
7 3,654,538

CLASS 321

8R 3,654,539
13 3,654,541
27R 3,654,542
3,654,543

CLASS 322

2 3,654,544

CLASS 323

6 3,654,546
74 3,654,547
75B 3,654,545

CLASS 324

20 3,654,548
34D 3,654,549
62 3,654,550
71PC 3,654,551
154R 3,654,552
175 3,654,553

CLASS 325

43 3,654,554
348 3,654,555
446 3,654,556
465 3,654,557

CLASS 328

35 3,654,558
61 3,654,559
127 3,654,560
151 3,654,561
3,654,562
167 3,654,563

CLASS 329

122 3,654,564

CLASS 330

43 3,654,565
124 3,654,566

CLASS 331

94.5 3,654,567
3,654,568
3,654,569

CLASS 333

11 3,654,570
21R 3,654,571
3,654,572
22R 3,654,573
30 3,654,574
3,654,575
31A 3,654,576
98R 3,654,577

CLASS 337

317 3,654,578

CLASS 338

2 3,654,579
61 3,654,580
162 3,654,581

CLASS 339

8A 3,654,582
14R 3,654,584
17C 3,654,583
17M 3,654,585
49R 3,654,586
53R 3,654,587
89R 3,654,588
110R 3,654,589
111 3,654,590
147R 3,654,591
176MP 3,654,592
188R 3,654,593
223R 3,654,594
256R 3,654,595

CLASS 340

3R 3,654,596
27NA 3,654,597
41 3,654,598
52D 3,654,600
52 3,654,599
58 3,654,601
64 3,654,602
146.1 3,654,603
147R 3,654,604
151 3,654,605
166 3,654,606
168 3,654,607
3,654,608
172.5 3,654,609
3,654,610
3,654,611
3,654,612
3,654,613
3,654,614
3,654,615
3,654,616
3,654,617
3,654,618
3,654,619
3,654,620
3,654,621
3,654,622
173CA 3,654,623
173CC 3,654,626
173LM 3,654,624
173R 3,654,625
174PW 3,654,627
174.1B 3,654,628

CLASS 350

3.5 3,653,736
7 3,653,737
96WG 3,653,738
96B 3,653,739
117 3,653,740
147 3,653,741
150 3,653,742
3,653,743
160R 3,653,744
3,653,745
161 3,653,746
171 3,653,747
3,653,748
184 3,653,749
189 3,653,750
211 3,653,751

CLASS 351

113 3,654,376

CLASS 352

72 3,653,752
100 3,653,753

CLASS 353

61 3,653,754

CLASS 355

3 3,653,755
3,653,756
13 3,653,757
16 3,653,758
38 3,653,759
39 3,653,760
51 3,653,761

CLASS 356

4 3,653,762
51 3,653,763
61 3,653,754
72 3,653,764

81	3,653,765	207	3,653,773	183	3,653,778		CLASS 417	508	3,653,788	133	3,653,336
86	3,653,766	254	3,653,774	206	3,653,779	12	3,653,782	534	3,653,789	328	3,653,793
102	3,653,767		CLASS 401		CLASS 408	298	3,653,783		CLASS 418	394	3,653,337
104	3,653,768	6	3,653,775	241	3,653,780	317	3,653,784	73	3,653,790		CLASS 431
141	3,653,769	86	3,653,776		CLASS 416	367	3,653,785	153	3,653,791	208	3,653,794
160	3,653,770	110	3,653,777	221	3,653,781	404	3,653,786		CLASS 425	247	3,653,795
194	3,653,771					415	3,653,787	1	3,653,792	328	3,653,796
205	3,653,772										

CLASSIFICATION OF DESIGNS

		223,323		6	223,241	D30—	43	223,258	D44—	10	223,276			223,293	D83—	1	223,309
		223,324			223,242	D33—	17	223,259		22	223,275	D56—	1	223,290	D85—	2	223,310
D94—	3	223,325		27	223,243			223,260		29	223,277		4	223,294		8	223,311
D 8—	57	223,226	D15—	1	223,244			223,261		31	223,278	D57—	1	223,295	D86—	10	223,312
	71	223,227		8	223,246			223,262			223,279			223,296			223,313
	114	223,228		11	223,245		21	223,263	D45—	19	223,280			223,297		11	223,314
	246	223,229	D16—	1	223,247	D34—	5	223,264	D48—	20	223,282			223,298	D87—	3	223,315
		223,230	D18—	2	223,248			223,265		27	223,283	D61—		223,299	D90—	20	223,316
	272	223,231	D22—	27	223,249		15	223,266			223,284	D64—	11	223,300			223,317
D 9—	180	223,232	D23—	4	223,250			223,267			223,285			223,301	D92—	26	223,318
	239	223,233	D25—	1	223,251			223,268		32	223,281		18	223,302			223,319
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DESIGN PATENTS

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6 : 3,098
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12 : 3,094

34 : 3,092

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39 : 3,097

41 : 3,093

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